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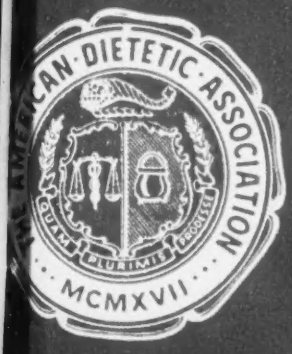

Meeting Amino Acid Requirements — *C. A Elvehjem*

Amino Acids in Foods — *A. W. Wertz et al.*

Supplements to Diabetic Diet Material — *Elizabeth K. Caso*

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Beef Costs from Carcass, Primal Cut, and Fabricated Sources
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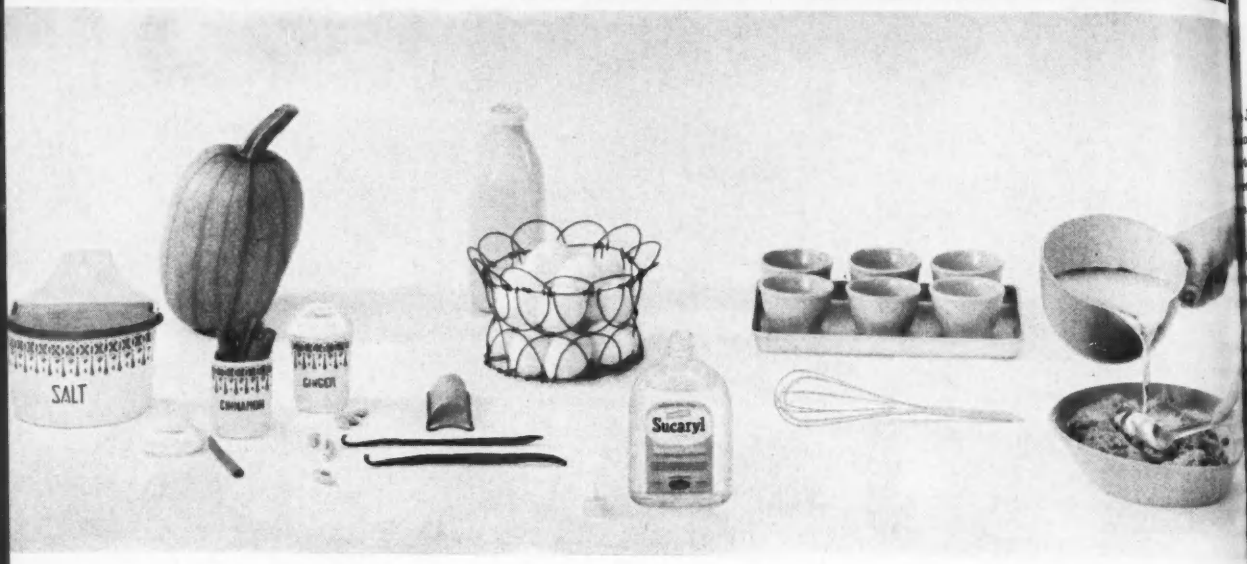

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Problems in Meeting Amino Acid Requirements[1]

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METHODS for the estimation of amino acids in foods are more satisfactory than is generally realized. The microbiologic assays which were first developed for the determination of vitamins have been found to be of real value. The chromatographic methods, which have been developed so successfully by Stein and Moore (1), are also most valuable and have certain advantages in separating the less known amino acids. Almost any amino acid once in the free form can now be determined with considerable accuracy. The most difficult problem which still remains is the liberation of amino acids from the protein. Acid hydrolysis can be used in all cases except tryptophan when some type of alkaline hydrolysis is needed. However, some amino acids are readily liberated, while others are released with more difficulty. Results reported recently by Li and Chung (2) indicate that the complete release of lysine from certain pure proteins may require hydrolysis for more than 20 hr. In some cases peptides tend to remain which interfere in both the microbiologic and the chromatographic procedures. Furthermore, higher concentrations of acid or prolonged heating may facilitate the release of certain amino acids, but these conditions may also increase the degree of destruction occurring during hydrolysis. Further difficulties have been encountered when the food is low in protein and high in carbohydrate, which means that the estimation of amino acids in cereals and cereal products gives us more difficulty.

Amino Acid Content of Foods

About three years ago a project was established in our laboratory, under support from the American Institute of Baking, to improve the methods for the estimation of amino acids in wheat, flour, and bread. After considerable effort, it was found that the interference due to the carbohydrate could be eliminated by using a smaller amount of sample and a larger volume of the hydrolysis mixture. Using this procedure and other improvements, satisfactory values for all the amino acids, except possibly cystine, have now been obtained for wheat, flour, and bread.

A few typical results are given in Table 1. It is obvious that when the values are calculated to an equivalent nitrogen basis, the two wheat samples contained almost identical amounts of each amino acid although the total protein differed by 2 per cent. The same relationships hold in the case of flour. When the composition of the flour is compared with the wheat from which it was produced, it is interesting that flour contained less lysine, arginine, aspartic acid, glycine, alanine, and tryptophan; greater amounts of glutamic acid, isoleucine, leucine, phenylalanine, proline, and serine; and similar amounts of histidine, methionine, threonine, tyrosine, and valine. Much more work of this type is needed if we are to understand the amino acid contribution of foods, but much of it is routine in nature and therefore not as interesting as other forms of research.

TABLE 1

Amino acids in wheat products

AMINO ACID	WHEAT		FLOUR	
	Sample 1 (15.5% protein)	Sample 2 (13.7% protein)	Sample 1 (14.5% protein)	Sample 2 (11.9% protein)
	gm./16 gm. N	*gm./16 gm. N*	*gm./16 gm. N*	*gm./16 gm. N*
Alanine	3.09	2.89	2.74	2.45
Arginine	4.67	4.68	3.69	3.60
Aspartic acid	4.95	5.09	3.90	3.83
Glycine	4.09	3.99	3.08	3.19
Glutamic acid	28.7	28.3	32.9	33.0
Histidine	1.88	1.90	1.75	1.92
Isoleucine	3.79	3.87	3.96	4.08
Leucine	6.36	6.56	6.57	6.68
Lysine	2.63	2.86	2.06	1.99
Methionine	1.73	1.77	1.63	1.59
Phenylalanine	4.72	4.45	4.86	4.85
Proline	10.3	10.3	11.3	11.7
Serine	5.14	5.15	5.40	5.62
Threonine	2.95	3.05	2.68	2.73
Tryptophan	1.03	1.13	0.98	1.01
Tyrosine	3.11	3.05	2.98	3.10
Valine	4.40	4.47	4.32	4.46

[1] The Mary Swartz Rose Memorial Lecture for 1956, presented before the Greater New York Dietetic Association in New York City, on February 21, 1956.

We may also ask, have all the amino acids been identified and determined in foods? In other words, can we account for all the nitrogen present? Attempts to answer this question have been made in the case of meat. Values for eighteen amino acids have been established for beef round, and the nitrogen in these amino acids accounts for 87 per cent of the total nitrogen (3). The contributions of other nitrogenous compounds present and by the ammonia present in the amide groups brings this figure to approximately 100 per cent. To investigate this question further, we separated the amino acids from a 10-hr. hydrolysate of beef round by adsorption on a column of Dowex 50 followed by gradient elution with continuously increasing concentrations of hydrochloric acid. A study of the elution curve indicated the presence of several peaks in addition to those for the eighteen amino acids measured microbiologically and for ammonia. By paper chromatography, the significant peaks were identified as hydroxyproline, taurine, and β-alanine. Quantitative figures were also obtained, and the value for β-alanine was many times the quantity which could be accounted for from the pantothenic acid content of meat. The complete distribution of nitrogen is given in Table 2. The total of all the nitrogen is so close to 100 per cent that we may have considerable confidence in the amino acid values.

A committee on amino acids of the Food and Nutrition Board, National Research Council, has been active for a year or more in an attempt to stimulate a tabulation of all data on the distribution of amino acids in foods. Dr. M. L. Orr and Dr. B. K. Watt of the Household Economics Research Branch, Agricultural Research Service, U. S. Department of Agriculture, are doing a remarkable job in collecting and compiling the available data. It is interesting to note that most of the data have been reported since 1945 and nearly half of the values since 1950. Values have been accumulated for about two hundred different foods, and while in many cases only a few analyses have been made on each food, in some cases as many as one hundred different analyses are available. This compilation should soon be available for distribution.

Just as in the case of vitamins, values for the distribution of amino acids in foods would have little worth unless we had fairly accurate values for the daily requirement, both in human beings and animals, and under different stages of development. Although there has been no rapid shift, at least in practical nutrition, from a consideration of protein requirements to amino acid requirements, it is perfectly obvious that such a shift must be made if we are to expect real progress. To continue the use of protein requirements would be the same as continuation of values for the B-complex rather than considering each individual B vitamin.

TABLE 2

Distribution of nitrogen in crude protein of beef round ($N \times 6.25$)

SOURCE OF NITROGEN	WEIGHT OF AMINO ACID	PER CENT NITROGEN IN AMINO ACID	WEIGHT OF NITROGEN IN AMINO ACID	PER CENT OF TOTAL WEIGHT
	gm./100 gm. protein		*gm.*	
Amino acids				
Arginine	6.7	32.2	2.160	13.50
Histidine	3.5	27.1	0.949	5.93
Isoleucine	5.7	10.7	0.610	3.81
Leucine	7.7	10.7	0.824	5.15
Lysine	8.7	19.2	1.670	10.44
Methionine	2.4	9.4	0.226	1.41
Phenylalanine	4.3	8.5	0.365	2.28
Threonine	4.4	11.7	0.515	3.22
Tryptophan	1.3	13.7	0.178	1.11
Valine	5.2	12.0	0.624	3.90
Aspartic acid	10.0	10.5	1.050	6.56
Glutamic acid	15.8	9.5	1.501	9.38
Glycine	4.6	18.7	0.860	5.38
Proline	3.8	12.2	0.464	2.90
Tyrosine	3.4	7.7	0.262	1.64
Alanine	6.2	15.7	0.973	6.08
Cystine	0.9	11.6	0.104	0.65
Serine	4.4	13.3	0.585	3.66
Hydroxyproline	0.7	10.7	0.075	0.47
Taurine	0.4	11.2	0.045	0.28
β-alanine	0.4	15.7	0.063	0.39
Other sources of nitrogen				
Vitamins including choline				0.40
Purine				2.00
Creatine (and creatinine)				4.10
Carnitine				0.09
Methyl guanidine				1.06
Ammonia (approximately)				5.00
Total				100.79

Amino Acid Requirements of Young Men

A survey of the literature reveals a much greater accumulation of data on amino acid requirements than is usually realized. The most extensive work and perhaps the best known is that of Dr. W. C. Rose, University of Illinois. It is interesting that as I was preparing this paper, the December number of the *Journal of Biological Chemistry* arrived which included the paper by Rose (4) and his co-workers on the valine requirement, which is the last of the eight amino acids recognized as essential for the human. In this paper he summarizes the amino acid requirements of man, proposing tentative minimum figures and also values which he considers as definitely safe intakes.

Perhaps even more interesting is the following paper (5), which considers the entire nitrogen intake.

In the earlier studies on the requirement of each amino acid, care was always taken to insure the intake of sufficient nitrogen to allow the synthesis of the so-called nonessential amino acids. In these studies, young men were given diets containing the safe intake of the eight essential amino acids, together with extra nitrogen in the form of urea and glycine. It was found that urea could be eliminated entirely and that glycine could be decreased to a considerable extent without interfering with positive nitrogen balance. The total nitrogen intake from these diets was 3.5 gm., of which the effective amino acids made up only 1.42 gm. Glycine supplied 1.21 gm., which is interesting, since in most foods there is about an equal ratio between the so-called essential and nonessential amino acids. Since some of the amino acids were fed in "D" form, 0.52 gm. nitrogen was supplied in a so-called ineffective form. Perhaps even more interesting is the fact that the diet used by Dr. Rose in this study contained 0.35 gm. of unknown nitrogen.

Further work is needed, therefore, to characterize these unknown forms of nitrogen and determine their significance in the maintenance of nitrogen balance. In any case, it is important to emphasize that the level of essential amino acids, even if we use the more generous values, cannot supply the entire nitrogen need. We must supply other forms of nitrogen, and it is apparent that any of the nonessential amino acids may function in supplying this nitrogen. This has been clearly demonstrated (6) in experimental animals when all of the protein has been supplied in the form of amino acids. To obtain fairly normal growth, some form of nitrogen other than that found in the so-called essential amino acids was needed.

Requirements of Infants

Dr. Rose has continually emphasized that all of his studies were conducted on young, adult males. However, it is interesting to point out that extensive studies are now being made with other age groups. Recent papers by Dr. Holt and his co-workers give the threonine (7) and the phenylalanine (8) requirements for the normal infant. Incidentally, in the first of these papers, the various methods for studying the amino acid requirements are outlined very briefly. They include the use of natural proteins deficient in some particular amino acid, the use of chemically degraded proteins or protein hydrolysates, the use of synthetic amino acid mixtures, or the calculation of the intake of amino acids from known diets compatible with good health.

The figures for threonine and phenylalanine are, of course, important in themselves, but more significant is the fact that these workers were able to maintain infants on a synthetic diet in which the nitrogen was provided in the form of eighteen essential and nonessential amino acids—all as natural isomers. On such a diet, the infants gained weight normally and exhibited every sign of adequate health. In contrast to the successful results obtained with rats and infants fed mixtures of amino acids, work with chicks indicates that additional factors are needed. Chicks placed on a completely synthetic diet in which all the protein fraction is supplied as amino acids grow only 4 gm. per day (9). However, when gelatin or zein is added, growth is 6 to 7 gm. daily. It is interesting that gelatin is more active than casein. As in the case of Dr. Rose's observations, the caloric requirement for the infants was somewhat higher than the average intake.

Future Problems for Research

Thus there seems to be no fundamental difficulty involved in future studies except the fact that much work remains in order to establish adequate values for each of the remaining amino acids and the effect of different combinations of amino acids. The phenylalanine requirement was found to be approximately 90 mg. per kilogram body weight per day. These workers also calculated from data available in the literature that an infant fed pooled breast milk for 4½ months, during which time the infant remained healthy and made excellent progress, ingested from 87 to 131 mg. phenylalanine per kilogram per day with an average of 116 mg. The threonine requirement was found to be about 60 mg. per kilogram of body weight per day.

Further studies using synthetic diets and a mixture of amino acids have been conducted on older individuals, especially on women, by Leverton (10) and by Jones (11). Again, the final figures vary somewhat from laboratory to laboratory, but there is no indication that there is any significant difference in the final values. There may be problems concerning the relative requirement of methionine and cystine, a sparing effect of tyrosine on phenylalanine, and so on, but these are questions that can be readily answered through careful experimental work.

It is clearly evident then that much more accurate work has been conducted regarding amino acid requirements than has been carried on as far as vitamins are concerned. Relatively few studies have been conducted in which highly purified diets have been used for the establishment of vitamin requirements. It might be interesting to return to synthetic diets containing amino acids for establishing vitamin requirements.

Difficulties are still encountered in attempts to establish specific requirements for each amino acid when we deal with various age groups. If we calculate the requirements as milligrams per kilogram body weight, the values for the infant may be three to nine times the requirement for the adult. At a conference called by the Food and Agriculture Organization of the United Nations in Rome last fall, it was suggested that it might be easier to deal with the ratio of amino acids rather than specific figures for

TABLE 3

Growth and liver fat of young rats fed low-protein diets containing beef or pork

DIET	GAIN	LIVER FAT
	gm./week	*% dry weight*
8 per cent pork	12.2	30.8
10 per cent pork	22.2	18.6
12 per cent pork	28.4	13.6
8 per cent beef	15.4	27.2
10 per cent beef	21.5	19.0
12 per cent beef	32.5	11.7
Stock diet	35.0	12.0

each amino acid. This group was impressed by the fact that the data from different laboratories show a very similar pattern when calculated on this basis. Using this pattern, a provisional reference protein was established, which was found to have a combination of amino acids similar to those proteins considered to be high in nutritive value, such as human milk, cow's milk, egg protein, and so on. When the amino acid pattern of so-called "poor" diets was compared with the reference protein, it was found that certain amino acids were limiting. In one case, the so-called poor quality diet was deficient in isoleucine, tryptophan, and sulphur amino acids. It remains, of course, to carry on experimental work to see if the deficiencies indicated by this calculation can actually be duplicated in animal experimentation.

Translating Needs into Diets

The problem which remains then is how to supply amino acid requirements from foods in a most satisfactory and efficient manner. As I have already indicated, most good quality proteins supply amino acids in adequate amounts and in a ratio which is compatible with optimum metabolism. If our diet contains a level of protein approximating 60 gm. per day, and this protein is of good quality, there seems to be no need for the supplementation or fortification of our diet with individual amino acids. However, if for one reason or another, the protein intake is reduced, we may encounter not only deficiencies of individual amino acids but serious imbalances. These imbalances may be aggravated if we try to rectify the deficiency of one amino acid without consideration of others.

I can give you a few typical examples using the rat as the experimental animal and 9 per cent casein as the source of protein. If threonine or phenylalanine is added to such a diet, there is a definite increase in the requirement for tryptophan. On the other hand, if the diet is supplemented with tryptophan and methionine, fairly normal growth results, but there is accumulation of fat in the liver. This accumulation of fat can readily be prevented or corrected by the addition of threonine, phenylalanine, and perhaps glycine. Certain modifications in the methionine intake may significantly alter the accumulation of

TABLE 4

Effect of amino acid supplements on growth and liver fat deposition of rats fed polished rice diets

RICE	SUPPLEMENTS	GROWTH IN TWO WEEKS	LIVER FAT
%		*gm./week*	*% dry weight*
89	none	8.8	28.0
89	0.2% lysine	8.5	25.7
89	0.24% threonine	8.2	31.9
89	0.2% lysine + 0.24% threonine	24.6	29.1
89	0.4% lysine + 0.5% threonine	21.8	15.2
84	3.3% casein	32.0	16.6
87	0.4% lysine + 0.5% threonine	16.6	12.9
87	0.4% lysine + 0.5% threonine + essential amino acids = 3.3% casein	30.6	14.9
87	0.4% lysine + 0.5% threonine + isoleucine + histidine + leucine + valine	27.2	13.8

fat in the liver. However, the addition of any good quality protein will give a uniform improvement in the rate of growth as well as in deposition of liver fat (Table 3).

Deficiencies and Imbalances

If we turn to proteins of poor quality, deficiencies of single amino acids are immediately apparent, but imbalances in the ratio of different amino acids may also be encountered. When we speak of poor quality proteins, we generally turn to the so-called cereal proteins—those present in rice, wheat and corn. If you use cereals as the main part of the diet, it is almost impossible to obtain a level of protein above 10 per cent in the total diet. When such diets are used, many interesting relationships are demonstrated. For example, rats receiving 90 per cent rice, which supplies approximately 6 per cent protein, grow considerably better than rats fed an equivalent amount of corn, which supplies 7.4 per cent of protein, but to a lesser extent than those fed wheat which provides 9.1 per cent protein.

If we study rice specifically, we find that the livers from rats fed the rice diet show significant accumulation of fat (Table 4). The addition of 2 per cent L-lysine hydrochloride and 0.24 per cent DL-threonine produces a significant growth response, but these additions do not influence the level of liver fat (12). When the lysine was increased to 0.4 per cent together with either 0.24 per cent or 0.5 per cent DL-threonine, the level of liver fat was normal. However, when this higher level of lysine was used, there was a definite retardation in growth. This was overcome by increasing the levels of leucine, isoleucine, valine, and histidine (13).

Studies on corn provided a more complex situation. Even when the corn was supplemented with the deficient amino acids in sufficient quantity to meet the daily requirement of the rat, growth was still poor.

Later work has shown that this is due to the very high level of leucine provided by the corn and that this high level can be counteracted by the addition of extra amounts of isoleucine. This relationship can be demonstrated using casein diets as well as corn diets. For example, the addition of leucine to a 9 per cent casein diet produces a definite growth depression. At the lower levels of leucine, isoleucine will counteract the effect almost entirely (14). However, with higher levels the isoleucine is only partially effective, and it has been found that extra amounts of valine are needed (15). Furthermore, isoleucine in the corn protein, zein, is relatively unavailable. Only about 20 per cent of the leucine can be utilized by the rat.

This introduces another significant problem in the practical use of foods for the supply of amino acids. We must know the relative availability of each amino acid in the protein. One wonders why nature produced a protein such as zein, which is high enough in leucine to increase isoleucine requirement, and furthermore place the isoleucine in such form that it is poorly utilized by the animal. However, when we thoroughly understand these relationships, we will be better able to explain some of the amino acid deficiencies encountered in those areas of the world where corn and rice are used as the main food supply.

In contrast to the observations on rice diets, no fat accumulates in the liver on the corn and wheat diets. This is undoubtedly due to a different type of amino acid combination. We are now in the midst of attempting to explain these differences. We believe that answers to these questions can only be obtained by simultaneous studies on the cereal protein in question, the effect of amino acid supplementation, and studies on the availability of different amino acids as well as their ratio in the total protein.

Conclusions may be erroneous as far as a fundamental understanding of this question is concerned if we use combinations of different proteins. For example, work by Rosenberg *et al.* (16) on bread fortification with lysine clearly demonstrates the significant effect of lysine and the relative lack of need of other amino acids. However, it is important to point out that these studies were done on bread containing 3 per cent of non-fat milk solids. When we realize that 3 per cent means 3 lb. milk solids per 100 lb. flour, and that the milk solids carry about 60 per cent protein, and the flour carries about 10 per cent protein, we realize that this is a supplementation of about 20 per cent protein to the protein supplied by the flour. These results, if properly interpreted, give us immediate practical application, but the individual proteins and foods must be studied to obtain the basic information. Fortunately we can now obtain such information and when it is obtained and accurately evaluated, protein nutrition—or should we say amino acid nutrition?—should be on a firm basis.

Finally, I would like to end with a sentence I used in a paper fourteen years ago: "Solution of some of these problems will insure a more sensible use of our natural food supply and a more adequate nutrition for everyone."

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Amino Acid Content of Foods[1]

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DATA have been obtained in this laboratory on the essential amino acid content of some of the foods that appeared several times in the diets of subjects cooperating in a study on amino acid metabolism in pregnancy. Although the number of samples of the individual foods was limited, ranging from two to eight, it was thought that the figures might be of interest.

Procedures

The samples of foods for analysis were obtained as the food was served for eating. The food taken as a sample for analysis, which was comparable in size to an average serving, was placed in an air-tight container and refrigerated until prepared for analysis within 24 hr.

Samples of high-fat foods, such as meat and cheese, were dried in a vacuum oven at 65°C., defatted, and ground in a Wiley mill. Dry cereal foods were ground in a Wiley mill or with a mortar and pestle, without any previous treatment. All other foods were puréed in a Waring Blendor.

Hydrolysates for the analysis of tryptophan were prepared by autoclaving the food aliquot in 4N sodium hydroxide at 15 lb. pressure for 15 hr. Hydrolysates for the analysis of isoleucine, leucine, lysine, methionine, phenylalanine, threonine, and valine were prepared by autoclaving the food aliquots in 4N hydrochloric acid at 15 lb. pressure for 10 hr. The alkaline hydrolysates were adjusted to *p*H 6.8, made to suitable volume, filtered, and frozen at −20°C. until analyzed. The acid hydrolysates were adjusted to *p*H 4.0, made to 100 ml., and filtered through sintered glass funnels (1) or Pyrex glass wool to remove any humin formed during the hydrolysis. Aliquots of the filtrates were adjusted to *p*H 6.8, made to suitable volume, and frozen at −20°C. until analyzed.

The amino acids were determined in the hydrolysates by the microbiologic method. *Leuconostoc mesenteroides* P-60 was the organism employed in the assay of leucine, lysine, methionine, phenylalanine, and tryptophan according to the method of Steele *et al.* (2); *Streptococcus faecalis* R for threonine with medium of Henderson and Snell (3); *Lactobacillus plantarum* 17-5 for isoleucine and valine with medium I of Sauberlich and Baumann (4). In this laboratory, recoveries of amino acids added to food aliquots before hydrolysis ranged from 87 to 110 per cent.

Results and Discussion

Data on the essential amino acid content of seventy-four cooked or ready-to-eat foods are presented in Table 1; findings are expressed as the mean value of the results and the standard error of the mean. As nitrogen analysis was not made on these foods, it is not possible to compare the results exactly with those reported in the literature on the same foods. However, if the values given by Block and Bolling (5), which are on the basis of grams of amino acid per 16 gm. nitrogen, are recalculated on the basis of the amount of protein that is given in the Agriculture Handbook No. 8 (6) for certain cooked or ready-to-eat foods, it is possible to make some approximate comparisons.

In general, the values for fish, eggs, Cheddar cheese, beef, and beef liver agree within reasonable limits with the values calculated from the data of Block and Bolling (5) and the data reported by other workers (7–11). However, the leucine value for Cheddar cheese and the isoleucine, leucine, and lysine figures for beef liver obtained in the present study were from 20 to 40 per cent higher.

Although only approximate comparisons can be made between the values obtained for the ready-to-eat cereals and the published values for the whole grains, it is interesting to note that the lysine and tryptophan values for the ready-to-eat whole wheat, corn, oat, and rice breakfast foods ranged from 30 to 50 per cent less than the values reported for the whole grains (5, 11). This decrease in lysine and tryptophan may be, to some extent, the result of the heat treatment undergone in processing of these foods. The amino acid values obtained in this study for boiled Irish potatoes were higher, for cooked frozen green peas approximately the same, and for cooked frozen

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TABLE 1

Essential amino acid content of cooked or ready-to-eat-foods

FOOD	NUMBER OF SAMPLES	ISOLEUCINE	LEUCINE	LYSINE	METHIONINE	PHENYL-ALANINE	THREONINE	TRYPTOPHAN	VALINE
		mg./gm.	*mg./gm.*	*mg./gm.*	*mg./gm.*	*mg./gm.*	*mg./gm.*	*mg./gm.*	*mg./gm.*
Banana, raw	2	0.69 ± 0.02*	0.99 ± 0.09	0.59 ± 0.03	0.11 ± 0.03	0.40 ± 0.03	0.48 ± 0.05	0.13 ± 0.03	0.83 ± 0.17
Beans									
Baked, canned	3	3.99 ± 0.17	5.30 ± 0.46	3.61 ± 0.12	0.74 ± 0.10	3.50 ± 0.07	2.93 ± 0.18	0.58 ± 0.05	3.77 ± 0.25
Green, frozen, cooked	2	0.85 ± 0.01	0.92 ± 0.05	0.70 ± 0.04	0.18 ± 0.02	0.51 ± 0.04	0.56 ± 0.01	0.10 ± 0.03	1.02 ± 0.08
Lima, frozen, cooked	2	6.19 ± 0.91	5.92 ± 0.42	4.52 ± 0.12	0.74 ± 0.03	3.31 ± 0.45	3.26 ± 0.07	0.73 ± 0.02	4.01 ± 0.31
Wax, frozen, cooked	2	0.93 ± 0.06	1.14 ± 0.11	0.93 ± 0.11	0.17†	0.61 ± 0	0.69 ± 0.03	0.12†	1.03 ± 0.07
Beef									
Hamburg, fried	3	11.30 ± 0.89	17.40 ± 1.13	13.84 ± 3.10	5.56 ± 0.46	8.48 ± 0.73	8.28 ± 0.55	1.57 ± 0.16	10.39 ± 0.82
Liver, fried	4	16.17 ± 1.74	26.94 ± 1.99	20.10 ± 1.04	7.61 ± 0.60	14.83 ± 0.95	14.56 ± 0.34	3.10 ± 0.14	16.25 ± 1.11
Roast, medium fat	5	17.58 ± 0.50	21.66 ± 0.68	20.11 ± 0.73	7.28 ± 0.17	10.18 ± 0.14	11.12 ± 0.14	2.24 ± 0.12	13.36 ± 0.30
Sausage, fried	2	9.03 ± 1.71	13.57 ± 0.15	11.75 ± 2.47	4.30 ± 0.10	6.63 ± 0.61	6.33 ± 0.55	1.12 ± 0.08	8.81 ± 0.83
Beef, mixed dishes									
Dried beef, creamed	2	7.80 ± 0.04	9.03 ± 0.13	8.59 ± 0.39	3.18 ± 0.16	4.55 ± 0.11	4.84 ± 0.06	1.07 ± 0.08	6.36 ± 0.12
Hamburg loaf	5	9.70 ± 0.86	13.46 ± 1.93	12.48 ± 1.15	4.55 ± 0.54	6.98 ± 0.54	7.47 ± 0.59	1.25 ± 0.17	9.34 ± 1.26
Hamburg and macaroni	2	6.02 ± 1.34	5.46 ± 1.06	4.70 ± 0.50	1.67 ± 0.11	3.45 ± 0.27	3.04 ± 0.14	0.47 ± 0.19	3.74 ± 0.58
Hash	5	6.07 ± 0.46	7.63 ± 0.36	7.62 ± 0.50	2.39 ± 0.20	4.06 ± 0.30	4.00 ± 0.28	0.75 ± 0.05	4.80 ± 0.30
Stew	2	3.21 ± 0.40	5.23 ± 0.38	4.21 ± 0.40	1.67 ± 0.13	2.44 ± 0.13	2.17 ± 0.26	0.29 ± 0	3.02 ± 0.16
Bologna, Polish ring	2	14.21 ± 0.24	15.80 ± 1.84	17.16 ± 2.84	5.08 ± 0.88	7.99 ± 1.49	8.91 ± 1.50	1.47 ± 0.21	10.80 ± 1.86
Breads:									
Raisin	2	4.90 ± 0.04	7.04 ± 0.45	2.08 ± 0.12	1.21 ± 0.02	4.90 ± 0.64	3.16 ± 0.36	0.79 ± 0	3.94 ± 1.04
Rye	3	5.79 ± 0.32	7.84 ± 0.12	2.42 ± 0.28	1.55 ± 0.12	5.55 ± 0.12	3.44 ± 0.32	0.87 ± 0.08	5.21 ± 0.36
Sweet roll	3	4.76 ± 0.75	4.38 ± 0.71	1.90 ± 0.14	1.13 ± 0.58	3.89 ± 0.73	1.86 ± 0.65	0.53 ± 0.35	3.31 ± 1.31
White	5	5.51 ± 0.10	7.94 ± 0.37	2.54 ± 0.03	1.62 ± 0.10	5.29 ± 0.27	3.32 ± 0.18	0.89 ± 0.07	5.46 ± 0.34
Whole wheat	3	5.79 ± 0.24	8.15 ± 0.41	2.60 ± 0.12	1.70 ± 0.13	5.70 ± 0.12	3.50 ± 0.47	1.00 ± 0.05	5.31 ± 0.25
Breakfast foods, ready-to-eat									
Bran flakes	2	5.31 ± 0.45	7.27 ± 0.47	2.00 ± 0.01	1.81 ± 0.11	4.57 ± 0.13	3.31 ± 0.07	0.86 ± 0.03	4.79 ± 0.03
Corn flakes	2	3.99 ± 0.03	11.11 ± 0.40	0.57 ± 0.09	2.09 ± 0.28	3.84 ± 0.11	2.81 ± 0.23	0.26 ± 0.05	3.59 ± 0.07
Corn puffs	2	4.25 ± 0.05	10.65 ± 0.03	0.91 ± 0.04	1.69 ± 0.09	4.07 ± 0.00	2.82 ± 0.18	0.30 ± 0	4.63 ± 0.09
Oat cereal	2	7.49 ± 0.43	11.14 ± 0.50	4.24 ± 0.24	2.50 ± 0.06	7.22 ± 0.43	4.12 ± 0.21	1.34 ± 0.12	8.15 ± 1.15
Rice cereal	2	3.92 ± 0.08	5.40 ± 0.47	1.31 ± 0.05	1.70 ± 0.25	3.36 ± 0.03	2.58 ± 0.36	0.59 ± 0.01	4.10 ± 0.10
Wheat, puffed	2	7.56 ± 0.06	9.31 ± 0.79	1.17 ± 0.03	1.90 ± 0.46	5.72 ± 0.16	4.01 ± 0.04	1.03 ± 0.09	6.33 ± 0.08
Wheat, shredded	2	5.94 ± 0.18	7.46 ± 0.16	2.94 ± 0.14	1.92 ± 0.08	4.17 ± 0.13	3.54 ± 0.12	0.96 ± 0.02	5.02 ± 0.14
Cakes									
Angel food	2	4.44 ± 0.55	6.84 ± 0.38	3.95 ± 0.11	2.08 ± 0.16	4.66 ± 0.36	3.38 ± 0.43	0.74 ± 0.12	5.39 ± 0.62
Chocolate, frosted	3	2.93 ± 0.47	3.70 ± 0.48	1.90 ± 0.29	1.12 ± 0.19	2.52 ± 0.42	1.76 ± 0.20	0.32 ± 0.03	2.76 ± 0.32
Molasses, spice	3	3.03 ± 0.31	3.27 ± 0.24	1.03 ± 0.17	1.01 ± 0.16	2.41 ± 0.38	1.50 ± 0.24	0.39 ± 0.08	2.28 ± 0.37
Cheese									
Blue mold	2	15.66 ± 1.24	18.74 ± 1.16	19.88 ± 0.42	6.30 ± 0.66	10.78 ± 0.72	10.99 ± 0.95	2.32 ± 0.05	14.70 ± 0.44
Cheddar	5	21.22 ± 0.39	30.56 ± 0.78	23.27 ± 0.33	9.96 ± 0.29	15.08 ± 0.32	10.02 ± 0.39	2.65 ± 0.12	18.46 ± 0.48
Cheddar, processed	3	17.99 ± 0.43	26.69 ± 0.82	20.61 ± 0.47	7.39 ± 0.61	12.97 ± 0.15	9.30 ± 0.11	2.58 ± 0.21	16.19 ± 0.33
Cottage	2	16.25 ± 0.62	14.37 ± 0.27	11.64 ± 0.47	4.01 ± 0.18	7.38 ± 0.16	5.96 ± 0.32	1.41 ± 0.19	9.65 ± 0.21
Cookies									
Fruit and nut	4	4.49 ± 0.48	6.44 ± 0.93	2.28 ± 0.30	1.50 ± 0.16	3.82 ± 0.57	3.07 ± 0.18	0.63 ± 0.09	3.55 ± 0.42
Plain	3	2.35 ± 0.02	4.03 ± 0.02	0.98 ± 0.12	0.82 ± 0.08	2.27 ± 0.14	1.61 ± 0.13	0.28 ± 0.01	2.19 ± 0.03
Corn									
Cream style, canned	2	1.85 ± 0.70	4.12 ± 1.56	1.19 ± 0.45	0.70 ± 0.17	1.66 ± 0.61	1.15 ± 0.37	0.12 ± 0.02	2.05 ± 0.87
Whole kernel, canned	2	1.48 ± 0.12	3.42 ± 0.17	0.98 ± 0.09	0.63 ± 0.13	1.24 ± 0.05	1.07 ± 0.03	0.16 ± 0.01	1.59 ± 0.03
Crackers									
Graham	2	4.14 ± 0.01	5.42 ± 0.52	0.62 ± 0.06	1.31 ± 0.03	3.65 ± 0.03	1.89 ± 0.12	0.51 ± 0.01	3.16 ± 0.27
Milk	2	4.67 ± 0.05	6.00 ± 0.28	1.50 ± 0.06	1.30 ± 0.17	3.83 ± 0.34	2.56 ± 0.12	0.60 ± 0.06	3.93 ± 0.21
Salted, high fat	2	3.83 ± 0.23	4.83 ± 0.15	1.05 ± 0.01	1.33 ± 0.03	3.63 ± 0.21	1.97 ± 0.08	0.42 ± 0.05	3.09 ± 0.29
Salted, high fat, cheese	2	6.86 ± 0.28	10.20 ± 0.54	4.42 ± 0.15	2.22 ± 0.32	5.50 ± 0.09	3.68 ± 0.19	0.71 ± 0.05	6.50 ± 0.26
Saltine	2	5.25 ± 0.25	7.98 ± 0.82	2.28 ± 0.10	2.01 ± 0.19	5.16 ± 0.40	3.09 ± 0.21	0.80 ± 0.03	5.79 ± 1.07
Shredded wheat	2	5.43 ± 0.15	6.76 ± 0.38	2.54 ± 0.20	1.42 ± 0.16	4.43 ± 0.03	3.24 ± 0.03	0.43 ± 0.11	4.64 ± 0.05
Wheat wafer	2	3.97 ± 0.10	6.46 ± 0.16	2.00 ± 0.02	1.07 ± 0.03	4.09 ± 0.10	2.72 ± 0.03	0.37 ± 0	4.82 ± 0.08
Doughnuts									
Cake type	2	3.79 ± 0.21	5.42 ± 0.17	2.33 ± 0.13	0.85 ± 0.04	3.21 ± 0.29	2.41 ± 0.08	0.49 ± 0.02	3.73 ± 0.01
Raised	3	3.62 ± 0.20	4.95 ± 0.12	1.59 ± 0.07	0.98 ± 0.08	3.44 ± 0.14	2.51 ± 0.33	0.54 ± 0.02	3.04 ± 0.10
Eggs									
Boiled	2	9.62 ± 0.41	14.33 ± 0.70	8.49 ± 0.13	5.46 ± 0.29	8.18 ± 0.54	6.49 ± 0.37	1.78 ± 0.22	9.92 ± 0.46
Fried	2	10.40 ± 0.29	15.45 ± 0.47	8.26 ± 0.61	5.39 ± 0.36	8.06 ± 0.28	6.99 ± 0.27	1.61 ± 0.06	10.35 ± 0.27
Scrambled, milk added	2	8.54 ± 0.14	10.86 ± 0.18	7.50 ± 0.08	3.76 ± 0.14	6.02 ± 0.07	5.42 ± 0.01	1.23 ± 0.09	7.15 ± 0.17
Fish									
Haddock, fried	2	16.62 ± 0.68	19.90 ± 0.67	22.05 ± 0.54	8.07 ± 0.03	9.45 ± 0.11	9.97 ± 0.07	1.85 ± 0.01	16.21 ± 2.83
Halibut, fried	2	20.49 ± 1.11	22.75 ± 0.13	24.27 ± 1.71	9.05 ± 0.77	11.56 ± 0.67	11.56 ± 0.35	2.38 ± 0.19	20.48 ± 4.81
Mackerel, fried	2	16.26 ± 3.34	18.05 ± 2.81	19.93 ± 3.07	7.44 ± 1.24	9.11 ± 1.25	10.13 ± 1.46	1.76 ± 0.32	13.77 ± 1.70
Frankfurters	2	8.58 ± 0.29	12.74 ± 2.73	10.65 ± 3.65	4.00 ± 0.10	6.06 ± 0.75	7.98 ± 0.78	1.10 ± 0.04	8.92 ± 0.52
Ham, boiled	3	14.56 ± 1.22	22.87 ± 1.60	16.84 ± 1.75	7.10 ± 0.29	9.62 ± 0.74	10.14 ± 0.86	1.92 ± 0.18	12.87 ± 0.86
Ham loaf	3	12.60 ± 0.72	15.85 ± 2.93	17.11 ± 2.16	6.17 ± 0.77	8.62 ± 0.83	9.21 ± 1.17	1.75 ± 0.25	11.52 ± 0.44
Ham and egg omelet	2	12.79 ± 0.19	16.28 ± 2.48	14.60 ± 1.50	5.87 ± 0.97	8.96 ± 0.48	11.34 ± 2.57	1.87 ± 0.03	10.75 ± 0.45
Liverwurst	2	8.37 ± 0.41	12.95 ± 1.19	13.36 ± 1.64	4.33 ± 0.15	7.55 ± 0.55	8.38 ± 0.06	1.42 ± 0.11	9.96 ± 0.56
Noodles, Chinese	2	6.11 ± 0.15	8.63 ± 0.31	1.65 ± 0.39	1.48 ± 0.01	5.71 ± 1.81	3.39 ± 0.41	0.75 ± 0	5.25 ± 0.50

TABLE 1 (*Concluded*)

FOOD	NUMBER OF SAMPLES	ISOLEUCINE	LEUCINE	LYSINE	METHIONINE	PHENYLALANINE	THREONINE	TRYPTOPHAN	VALINE
		mg./gm.	*mg./gm.*	*mg./gm.*	*mg./gm.*	*mg./gm.*	*mg./gm.*	*mg./gm.*	*mg./gm.*
Peanuts, roasted	2	14.58 ± 0.78	20.73 ± 0.93	9.13 ± 0.11	3.01 ± 0.25	15.63 ± 0.07	8.23 ± 0.24	1.91 ± 0.07	13.39 ± 1.04
Peas, frozen, cooked	2	2.98 ± 0.10	2.82 ± 0.44	2.69 ± 0.53	0.40 ± 0.11	1.52 ± 0.19	2.10 ± 0.21	0.25 ± 0.03	2.48 ± 0.10
Pies									
Fruit or berry	3	1.53 ± 0.12	1.84 ± 0.55	0.64 ± 0.10	0.42 ± 0.02	1.36 ± 0.21	0.84 ± 0.10	0.18 ± 0.04	1.13 ± 0.37
Soft custard-type	3	3.25 ± 0.42	3.40 ± 0.18	1.92 ± 0.14	0.87 ± 0.09	2.21 ± 0.28	1.39 ± 0.06	0.35 ± 0.01	2.31 ± 0.10
Potatoes									
Boiled	2	0.89 ± 0.05	1.09 ± 0.15	1.10 ± 0	0.26 ± 0.08	0.86 ± 0.03	0.76 ± 0.03	0.24 ± 0.03	1.19 ± 0.02
Chips	2	3.46 ± 0.46	4.21 ± 0.07	3.66 ± 0.23	0.92 ± 0.03	2.79 ± 0.01	2.48 ± 0.05	0.57 ± 0.08	4.22 ± 0.06
French fried	2	2.89 ± 0.27	2.25 ± 0.20	2.03 ± 0.05	0.47 ± 0.01	1.57 ± 0	1.47 ± 0.09	0.45 ± 0.01	2.48 ± 0.13
Mashed	2	1.21 ± 0.10	1.54 ± 0.08	1.31 ± 0.03	0.35 ± 0.09	1.04 ± 0.06	1.02 ± 0.20	0.22 ± 0.03	1.25 ± 0.05
Popcorn	2	4.61 ± 0.01	14.44 ± 1.80	1.77 ± 0.21	2.15 ± 0.17	5.06 ± 0.56	3.44 ± 0.12	0.32 ± 0	5.20 ± 0.36
Prunes, cooked	2	0.71 ± 0.16	0.70 ± 0.01	0.49 ± 0.01	‡	0.47 ± 0.03	0.44 ± 0.01	‡	0.64 ± 0.04
Pudding, soft custard-type	2	4.17 ± 0.03	5.76 ± 0.25	4.47 ± 0.13	1.38 ± 0.14	2.93 ± 0.08	2.78 ± 0.03	0.56 ± 0.01	3.90 ± 0.13
Rice, boiled	2	1.55 ± 0.03	2.28 ± 0.22	1.12 ± 0.09	0.55 ± 0.03	1.29 ± 0.14	1.15 ± 0.03	0.28 ± 0.01	1.93 ± 0.13
Spaghetti, canned, with tomato sauce	2	1.40 ± 0.14	1.55 ± 0.13	0.58 ± 0.04	0.39 ± 0.07	1.16 ± 0.06	0.71 ± 0.01	0.17 ± 0.05	0.95 ± 0.09
Vegetable soup, canned	2	1.06 ± 0.27	1.29 ± 0.17	0.98 ± 0.24	0.21 ± 0.03	0.80 ± 0.14	0.70 ± 0.18	0.09 ± 0.02	0.93 ± 0.32
Veal loaf	2	9.55 ± 1.45	12.96 ± 1.92	12.98 ± 0.48	4.22 ± 0.12	6.50 ± 0.88	6.29 ± 1.09	1.30 ± 0.07	8.50 ± 0.59

* Standard error.
† Only one sample.
‡ Concentration too low for reliable assay.

green beans and canned sweet corn from 15 to 50 per cent lower than those reported by Lyman and Kuiken (11) for the fresh vegetables. Undoubtedly, some variation in the amino acid content of cereals and vegetables exists because of the effect of certain growing conditions on the nitrogen content of the product.

In general, the greatest percentage variations between different samples of the same food were usually found in meat or meat products. Such variations were expected because of differences in original fat content, and the effect of cooking time and temperature on the moisture and fat content of the meat. Small percentage variations were usually found between the different samples of the same type of breads, cereals, and crackers.

The values presented in this paper are the result of the analysis of a limited number of samples of the food items and can give only an indication or approximation of the amino acids generally furnished by these foods. It is hoped that these data may be a useful addition to the information that already exists on the amino acid composition of foods and may make a contribution to the compilation in the future of a table for general use.

Summary

Data have been presented on the isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine content of seventy-four cooked or ready-to-eat foods.

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Supplements to Diabetic Diet Material

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SIMPLIFICATION of meal planning for the person with diabetes was the prime objective of the committee of The American Dietetic Association which cooperated with the American Diabetes Association and the Chronic Disease Program of the U.S. Public Health Service. The first report was published in 1950 (1). This action was prompted by the difficulties encountered by patients in following dietary regimens and by the professional team of physician, dietitian, and nurse in prescribing and interpreting the diet to the patient, such as:

(a) Lack of variety due to the limited choice of foods resulting in a monotonous menu.

(b) Numerous food restrictions often without scientific basis and frequently conflicting.

(c) Inflexibility in the dietary plan, making it difficult to adjust the diet to the family meal plan, to eating away from home, or to cultural or economic factors.

(d) Lack of instructions regarding food preparation to increase palatability of the diet.

(e) Complicated and impractical measurements of sizes of servings of food.

(f) Nutritional inadequacy of diet, especially in relation to calories (2).

In working out the original plan of the Exchange Lists (3) and the accompanying diabetic diet material (4, 5), every effort was made to overcome or minimize these problems.

Basic Principles of Diabetic Diet Planning

To allay misconceptions which inevitably occur, it would seem profitable to restate some of the basic principles which guided the committee in preparing the original diabetic diet material.

(a) In the management of diabetes, dietary regulation is deemed essential in order to help maintain metabolic equilibrium and to permit growth. Control of body weight at close-to-normal levels should be maintained.

(b) Total food intake must be *constant* from day to day with variations occurring only with increased activity when the intake would likewise be increased.

(c) The importance of the *distribution* of carbohydrates through the day was emphasized. For the patient controlled without insulin, total carbohydrate intake would usually be divided equally between three meals (or more, if the patient prefers). For the patient on "long-acting" insulin, the carbohydrate would be distributed between four to five meals with slightly less in the morning than at noon and in the evening, with mid-afternoon and/or evening "snacks," depending on the type of insulin used and the patient's own physiologic reactions.

(d) Restricted use of "concentrated carbohydrates" was recommended. Individual exceptions would be made on the advice of the physician.

(e) It was acknowledged that there is considerable variation in the composition of food due to varietal differences, variations in conditions of growth, degree of maturity, and methods of harvesting, storage, and preparation.

(f) On the other hand, great variation occurs from day to day in bodily requirements and utilization of food, conditions which are dependent on such factors as activity, emotional status, and insulin dosage. In fact, differences in bodily needs far exceed differences in food composition and, therefore, minimize the problem of the inevitable variation in food content. Thus, nothing more than reasonable detail was considered justifiable in calculating diets.

(g) The following were considered the fundamental tools for planning diabetic diets according to the recommended simplified method: a brief table of food values for calculating diabetic diets; a set of six lists of foods of similar composition which might be exchanged for one another; and an easy method of calculating diabetic diets based on these food values and food lists.

Exchange Lists Developed

To provide such working tools, the committee therefore, conceived the idea and compiled what have been called "Exchange Lists" (3). In addition, six dietary prescriptions (4) at different caloric levels

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SELECTION OF THE DIETARY PRESCRIPTION

A dietary prescription is based on the caloric needs of the patients. Caloric requirements are influenced by present weight in relation to desirable weight, activity, and body size. It is recommended that the desirable weight table be used and that an appraisal be made of the usual amount of activity in which the patient is involved. Then, select the dietary prescription best suited for the patient.

Adults

WEIGHT AND ACTIVITY OF PATIENT	HEIGHT BELOW 5′6″		HEIGHT ABOVE 5′6″	
	Caloric prescription	Corresponding Meal Plan No.	Caloric prescription	Corresponding Meal Plan No.
Ideal weight				
Sedentary	1800	3	2200	4
Moderately active	2600	8	3000	9
Very active	3000	9	3500	7
Overweight				
Sedentary	1200–1500	1 or 2	1500–1800	2 or 3
Moderately active	1800	3	2200	4
Very active	2200	4	2600	8

Children

The selection of the dietary prescription for children is more difficult than for adults. Sufficient calories must be supplied for proper growth and development and to meet energy needs. Diets for children at different ages and with different caloric requirements can easily be developed by adding additional amounts of the food exchanges, especially the Bread and Meat Exchanges (Lists 4 and 5) which provide approximately 70 calories per exchange.

AGE OF CHILD	CALORIC PRESCRIPTION	CORRESPONDING MEAL PLAN NO.
About 8 yr.	1800	5
10 to 12 yr., and girls 13 to 18 yr.	2600	6
Boys 13 to 18 yr.	3500	7

It is most important to realize that a periodic check-up is the only way to determine whether the prescribed diet is meeting or exceeding the caloric needs of the patient. On the basis of this observation, adjustments in the caloric level of the diet may be needed.

were presented as a further practical step in this plan for the dietary management of the diabetic persons. The grams of carbohydrate, protein, and fat suggested as these different caloric levels could be readily converted into a palatable diet similar to the food patterns of the majority of patients. It was understood that some variation from these suggested prescriptions would occur in special instances. As correlative material, six sample diets (5), based on these dietary prescriptions were prepared for *the use of the physician* only when the services of a dietitian were not available. Even under such circumstances, the "form diet" should be reviewed with the patient by the physician to make individual adjustments. The dietitian should plan each diet personally with each patient, taking into consideration his particular food habits (6). This was recognized as the most realistic approach to dietary instruction and the one most likely to assure cooperation by patients.

All of this diabetic diet material prepared by the committee was incorporated into: a booklet, "Meal Planning with Exchange Lists" (3), "Diabetic Diet Card for Physicians" (4), and "Meal Plans No. 1 through 6" (5). In 1953, two brief reports were published regarding the acceptance of this material (7, 8). Its widespread use throughout the country by physicians and hospitals, as well as its incorporation into medical, dietary, and nursing textbooks, has been gratifying. It has been roughly estimated that between 80,000 and 100,000 copies of "Meal Planning with Exchange Lists" are distributed annually.

New Supplementary Materials

During the years since the introduction of these diabetic diet materials, physicians using them have asked for some additions. These requests have been sufficiently numerous and thoughtful in character to warrant consideration. Therefore, the following supplementary material has been prepared, part of which is presented herewith:

(a) A guide for the selection of dietary prescriptions.

(b) Three dietary plans planned to provide higher caloric levels.

(c) Instructions for sodium restriction and the bland, low-fiber modification.

MODIFICATIONS OF EXCHANGE LISTS TO PERMIT SODIUM RESTRICTION

Follow your "Meal Planning with Exchange Lists" (3) with the changes listed below.

Add no salt in cooking or at the table.

LIST 1—MILK EXCHANGES—*Average sodium: 120 mg. per Exchange* (½ pt.)
Up to 1 pt. milk is allowed. If your diet calls for more than 1 pt. milk, use low-sodium milk (a special commercial product). Avoid any foods prepared with milk unless taken from the amount allowed for the day.

LIST 2—VEGETABLE EXCHANGES—*average sodium: 9 mg. per Exchange* (½ c.)
Use only *fresh* vegetables unless you are certain no sodium has been added to the canned or frozen ones.

Vegetable Exchanges A: select *only* from the vegetables list below:

Asparagus	Cucumbers	Lettuce
Broccoli	Escarole	Mushrooms
Brussels sprouts	Eggplant	Okra
Cabbage	Endive	Radishes
Cauliflower	Green beans	Summer squash
Chicory	Green peppers	Tomatoes
		Turnip greens

Vegetable Exchanges B: all vegetables on this list are allowed *except*: beets, carrots, and turnips.

LIST 3—FRUIT EXCHANGES—*average sodium: 2 mg. per Exchange*
All fruits are allowed. Raisins and dried figs have a higher sodium content than other fruits. Since the size serving allowed is small, they may be used.

LIST 4—BREAD EXCHANGES—*average sodium: 5 mg. per Exchange*
Use *only* home-made or bakery-made breads and rolls prepared without salt, milk, or salted fat. The following "quick breads" are permitted *provided* they are made with low-sodium baking powder: cornbread, rolls, muffins, and biscuits. Select *only* from the foods listed below:

Beans or peas, dried—½ c. cooked	Popcorn, unsalted—1½ c.
Corn, fresh or frozen (unsalted)—⅓ c.	Potato—1 (2 in. diameter)
Grits—½ c.	Puffed Rice—¾ c.
Lima beans, fresh—⅓ c.	Puffed Wheat—¾ c.
Macaroni—½ c.	Ralston—½ c.
Matzoth, unsalted—1 (6 in. diameter)	Rice—½ c.
Muffets—1 biscuit	Shredded Wheat—⅔ biscuit
Noodles—½ c.	Spaghetti—½ c.
Oatmeal—½ c.	Sweet potato—¼ c.
Parsnips—⅔ c.	Wheatena, regular—½ c.

LIST 5—MEAT EXCHANGES—*average sodium: 25 mg. per Exchange*
All varieties of meat, fish, or poultry are allowed *except*: shellfish (clams, oysters, shrimp, lobster), brains, kidney, and heart. One egg a day is allowed. *Omit* all smoked, salt-cured, dried, canned, and Kosher-cured meats or fish, including: cold cuts, frankfurters, sausage, ham, corned beef, and so on. *Omit* all types of cheese except "salt-free" cottage and Cheddar cheese. *Omit* peanut butter, unless it is a special, low-sodium variety. Low-sodium tuna fish and salmon are available in some stores.

LIST 6—FAT EXCHANGES—*average sodium: negligible*
All fats must be "salt free." Unsalted butter, margarine, fats, and oils are allowed. *Omit:* bacon, salt pork, mayonnaise, salad dressings with added salt, salted nuts, and olives.

Condiments and Flavorings That May Be Used

Allspice	Curry powder	Onion juice, fresh	Rosemary
Almond extract	Dill	Oregano	Saccharine
Aniseed	Garlic	Paprika	Saffron
Basil	Ginger	Parsley	Sage
Bay leaves	Horseradish root	Pepper (black, red, and white)	Savory
Calcium Sucaryl	Juniper	Peppermint	Sesame seeds
Caraway seeds	Lemon juice	Pimento	Sorrel
Cardamon	Mace	Poppy seeds	Tarragon
Cinnamon	Marjoram	Poultry seasoning	Thyme
Cocoa (1–2 tsp.)	Mint	Purslane	Tumeric
Chili powder	Mustard, dry		Vanilla extract
Chives			Vinegar

Do *Not* Use These Foods

(for other restrictions, see notes above under separate Exchange Lists)

Baking powder	Meat extracts	Potato chips
Baking soda	Meat sauces	Pretzels
Bouillon cubes	Monosodium glutamate	Relishes (commercial)
Celery salt	Mustard, prepared	Salt (table)
Garlic salt	Onion salt	Self-rising flour
Horseradish, prepared	Pickles	Soups, canned
Ketchup		Worcestershire sauce

Also: certain "stomach antacids," laxatives, and sedatives contain sodium and are not recommended.

Special Sodium-Restricted Dietetic Foods

Foods specially processed without salt or other sodium products for use with sodium-restricted diets are available. By law, the labels on these foods must state the amount of sodium in 100 gm. or for an average portion.

MODIFICATION OF EXCHANGE LISTS FOR BLAND, LOW-FIBER DIET

Follow your "Meal Planning with Exchange Lists" (3) with the following changes.

LIST 1—MILK EXCHANGES

Allowed in amounts prescribed in diet. Any form of milk is desirable (1 oz. Cheddar cheese and 2 soda crackers may be used for 1 c. [8 oz.] milk.)

LIST 2—VEGETABLE EXCHANGES

Omit raw vegetables. Use *only* vegetables in the following list:

Vegetable Exchanges A	*Vegetable Exchanges B*
Asparagus tips	Beets
Chard	Carrots
Spinach	Peas
Squash, summer (without seeds)	Pumpkin
String beans, young	Squash, winter
Tomato juice	
Tomato purée, unseasoned	

In special cases, the physician may recommend strained or puréed vegetables.

LIST 3—FRUIT EXCHANGES

Fruits should be cooked or canned unsweetened. The only fresh fruits allowed are marked with an asterisk (*). Avoid all skins or seeds. Select *only* the fruits listed below in amounts given in the "Meal Planning" booklet.

Applesauce or baked apple	Cherries, canned	Pear
Apricots, fresh	Grapefruit juice	Pineapple juice
Apricots, dried	*Orange juice	Plums, canned
*Banana	Peach	Prunes

In special cases, the physician may recommend strained fruits.

LIST 4—BREAD EXCHANGES.

Only *white*, refined breads, cereals, or crackers are allowed. Potatoes, sponge cake, and ice cream in measured amounts are also allowed. *Omit* corn, parsnips, dried beans and dried peas.

LIST 5—MEAT EXCHANGES

Use only tender cuts (whole, ground, or chopped) of beef, veal, lamb, pork, chicken, or liver. The following fish are allowed: cod, haddock, halibut, and similar white fish; salmon; tuna; and shellfish. Eggs, Cheddar and cottage cheese, and creamy peanut butter are allowed. *Omit* cold cuts, frankfurters, and sausages.

LIST 6—FAT EXCHANGES

Butter, margarine, cream, cream cheese, and bacon are the only foods allowed on this list.

In special cases, your physician may wish to make recommendations regarding the use of fried foods, tea, coffee, meat broths, and highly seasoned foods.

These additions have been made and now appear in the second edition of the *Diabetes Guide Book for the Physician* (9) recently published by the American Diabetes Association. They are also available in the newly revised "Diabetic Diet Card for Physicians" (4) and the new Meal Plans 7, 8, and 9 (10). Two additional leaflets will soon be available on the modifications of the Exchange Lists for sodium-restricted and bland, low-fiber diets. The complete "kit" on diabetic diet material will then be comprised of the booklet, "Meal Planning with Exchange Lists" (3) and twelve leaflets (4, 5, 10–12).

Dietary Prescriptions and New Sample Diets

The guide for selecting the dietary prescription which appears in the newly revised "Diabetic Diet Card for Physicians" accompanies this article on page 930. This is an attempt to indicate in a general way, the type of individual for whom the various sample dietary prescriptions would be most suitable. Again, the importance of individualization is stressed.

The original six sample dietary prescriptions ranged from 1200 to 2200 calories for adults and from 1800 to 2600 for children. In Table 1, these are summarized, together with the three new dietary prescriptions at higher caloric levels—2600 and 3000 for adults and one at 3500 for teen-age boys. Also included in this table is a suggested plan for converting these sample prescriptions into the total food for the day in terms of specific amounts of each of

TABLE 1

Total day's food in sample meal plans

MEAL PLAN NUMBER	CARBOHYDRATE	PROTEIN	FAT	CALORIES	MILK EXCHANGE (List 1)*	VEGETABLE EXCHANGES		FRUIT EXCHANGE (List 3)*	BREAD EXCHANGE (List 4)*	MEAT EXCHANGE (List 5)*	FAT EXCHANGE (List 6)*
						A (List 2)*	B (List 2)*				
	gm.	*gm.*	*gm.*								
1	125	60	50	1200	1 pt.	as desired	1	3	4	5	1
2	150	70	70	1500	1 pt.	as desired	1	3	6	6	4
3	180	80	80	1800	1 pt.	as desired	1	3	8	7	5
4	220	90	100	2200	1 pt.	as desired	1	4	10	8	8
5†	180	80	80	1800	1 qt.	as desired	1	3	6	5	3
6†	250	100	130	2600	1 qt.	as desired	1	4	10	7	11
7†	370	140	165	3500	1 qt.	as desired	1	6	17	10	15
8	250	115	130	2600	1 pt.	as desired	1	4	12	10	12
9	300	120	145	3000	1 pt.	as desired	1	4	15	10	15

* See "Meal Planning with Exchange Lists" (3).

† These diets contain more milk and are especially suitable for children.

TABLE 2

Composition of food exchanges

FOOD EXCHANGE	QUANTITY FOR ONE EXCHANGE		CARBOHYDRATE	PROTEIN	FAT	CALORIES
	Measure	Weight				
		gm.	*gm.*	*gm.*	*gm.*	
Milk	½ pt.	240	12	8	10	170
Vegetables—A	as desired	—	—	—	—	—
Vegetables—B	½ c.	100	7	2	—	36
Fruit	varies	—	10	—	—	40
Bread	varies	—	15	2	—	68
Meat	1 oz.	30	—	7	5	73
Fat	1 tsp.	5	—	—	5	45

the six Exchange Lists. For example, according to the table, a prescription for 2600 calories for an adult containing 250 gm. carbohydrate; 115 gm. protein, and 130 gm. fat, might be worked out (Meal Plan No. 8) to supply: 2 Milk Exchanges; Vegetable Exchanges A as desired; 1 Vegetable Exchange B; 4 Fruit Exchanges; 12 Bread Exchanges; 10 Meat Exchanges; and 12 Fat Exchanges. However, a patient with different food preferences might wish to have this same dietary prescription converted into some other arrangement of foods, such as 4 Milk Exchanges, the same amount of vegetables, 6 Fruit Exchanges, and 9 each of Bread, Meat, and Fat Exchanges. Use of the table of food composition (Table 2) makes it relatively simple for the dietitian to calculate this or still other arrangements individually for the patient rather than using the sample "Meal Plan" inserts prepared for physicians to accompany the "Meal Planning with Exchange Lists" booklet. The three new sample "Meal Plans," Nos. 7, 8, and 9, are now available with the other new material from The American Dietetic Association.

Low-Sodium and Bland, Low-Fiber Diets in Diabetes

A patient with diabetes may have medical complications requiring, in addition to the diabetic diet, restriction of the sodium intake or modification of the fiber content of the diet. Instead of confusing the individual with two separate diets which might be difficult to coordinate, material has been prepared to explain how the six Exchange Lists which form the basis of the diabetic diet can be adapted to these modifications. These are presented in the boxes on pages 931 and 932.

TABLE 3

Sodium content of sample Meals Plans 1 through 9

MEAL PLAN NUMBER	SODIUM CONTENT	SODIUM CHLORIDE CONTENT
	mg.	*gm.*
1, 2, 3, and 4	400–500	1
5, 6, and 7	700–850	2
8 and 9	600	1½

With the modifications suggested for a low-sodium diet, the various meal plans would contain approximately the amounts of sodium and sodium chloride listed in Table 3. The range of sodium content of these meal plans is due to the inclusion of additional foods at the higher caloric levels. Further restriction can, of course, be obtained by substituting low-sodium milk for regular milk. Since 1 c. milk contains 120 mg. sodium, this would result in a substantial reduction in sodium content of the diet—from 480 to 240 mg. sodium, depending on whether 1 qt. or 1 pt. milk is included in the meal plan.

Summary

In response to popular request, supplements to the original diabetic diet material have been prepared. This consists of a guide for the selection of the dietary prescription for physicians, three new sample meal plans at higher caloric levels, and suggestions for modifying the sodium and fiber content of the diabetic diet by adaption of the six Exchange Lists.

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Eugene Floyd DuBois

In January 1956, The New York Academy of Medicine paid honor to Eugene Floyd DuBois, M.D., in presenting to him its Medal for Distinguished Service. Because of his contributions to the field of metabolism and nutrition, excerpts of the presentation by David P. Barr, as published in the Bulletin of The New York Academy of Medicine *(32: 264, 1956), are of interest to nutritionists and dietitians:*

Eugene DuBois, whom we honor tonight, was fortunate in acquiring early in his professional life an absorbing interest in a fundamentally important and relatively new branch of medicine. . . In 1911, some forty-five years ago . . . he established under the stimulation of Graham Lusk and with the financial aid of the Russell Sage Institute of Pathology a laboratory for investigation of human calorimetry.

This pioneering venture, small and modest at its inception, was destined to have an extraordinary influence on the development of medical science. In a relatively short time there came from DuBois' laboratory contributions on metabolic disturbances in typhoid fever, tuberculosis, malaria, pernicious anemia, leukemia, thyrotoxicosis, nephritis, and cardiac disease. . . He established a relatively simple formula for the estimation of surface area, now recognized throughout the world as basic to the study of human nutrition and metabolism. With other associates he demonstrated the physical mechanisms of fever and the applicability of van't Hoff's Law to variations in total metabolism observed in fever. Inferences from this work in calorimetry led directly to remarkable studies and to formulations concerning skin temperature and heat radiation.

The significance of the venture was by no means limited to its scientific contributions. To DuBois' laboratory flocked a notable group of young clinical investigators, men who were destined to be leaders of medicine in our generation. This extraordinary influence has been attributable only in part to his mastery of experimental procedure and the intrinsic value of his scientific contributions. Its essence derives from his own character and personality. Inspiration has come to others from his abiding faith in principles of scientific and personal conduct, from his integrity and tolerance, and from his sympathetic understanding of the problems of those about him. His character has influenced behavior of his colleagues. It has also influenced innumerable students who have learned from him lessons of critical evaluation, clear expression, unvarying courtesy, and true humility.

Dr. DuBois' military record in the service of his country is one of remarkable achievement and constant contribution. It has been pursued so quietly and at times so secretly that few have realized its extent or significance. In the fields of submarine warfare and aviation medicine, he is an outstanding authority. For heroism in the conduct of hazardous experiments during the first World War, he received the Navy Cross. His service during the second World War was recognized by Commendation and Ribbon Bar. His contributions still continue, and his association with the military service has been maintained and productive since his retirements from academic posts.

To his innumerable friends, it is a matter of satisfaction that honors have been showered upon him: membership in the National Academy of Science and the Philosophical Society, Presidency of the American Society of Clinical Investigation, of the Association of American Physicians, of the Harvey Society, and of the Institute of Nutrition.

With the Medal of the Academy I carry to him this citation: to Eugene Floyd DuBois, *physiologist, physician, educator, patriot . . . in recognition of his fundamental contributions to the science of metabolism and the understanding of disease; of his influence upon the thought and activities of other leaders of medicine; of his accomplishments in the development of clinical science and medical education; of his sympathetic understanding and encouragement of younger men; of his service to his country during two world wars in solution of physiologic problems in aviation medicine and submarine warfare. His life and work have brought honor to the profession of medicine.*—Contributed by Mary Pascoe Huddleson, Portland, Oregon.

Effect of Delayed Cooking on Bacteria in Meat Loaf[1]

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USE OF electric ranges with fully automatic ovens has increased the tendency to prepare various foods several hours in advance of baking. This delay, combined with the temperature at which the foods are held, may afford an excellent opportunity for bacterial growth prior to baking. Jensen (1) reports that when foods are held between 50° and 120°F. for 4 to 8 hr., they are in the incubation zone for bacteria associated with food poisoning. Since some micrococci produce thermostable toxins, the care that food receives before cooking is of utmost importance. The food, even after cooking, may constitute a health hazard. Hussemann (2), studying the bacterial flora of commercially frozen precooked combination meat dishes, and Deskins and Hussemann (3), working with ground ham mixtures, found that although cooking reduced the number of microorganisms, it did not destroy all of them.

The incidence of bacterial food poisoning has increased in recent years. Dauer and Sylvester (4) reported 234 outbreaks of food poisoning with 11,704 cases in the United States during 1954. The organisms most frequently involved in such outbreaks of food poisoning are: *Micrococcus pyogenes* var. *aureus*, *Salmonella typhimurium*, and *Streptococcus faecalis* (Jensen [5] and Tanner and Tanner [6]).

Meat and combination meat dishes are often involved in food poisoning outbreaks. Ground beef has a relatively high initial bacterial count, and when combined with milk, eggs, and bread crumbs, as in meat loaf, may be favorable for the growth of bacteria and toxin formation.

The purpose of this study was to determine the bacterial content of ground beef meat loaf held at room temperature or above for varying lengths of time prior to cooking, and after cooking. Some of the meat loaves were inoculated with bacteria previously isolated from foods associated with food poisoning outbreaks since it seemed advisable to insure the presence of these organisms in known numbers.

Experimental Procedure

Prior to starting the actual experimental work, preliminary tests established certain techniques and procedures which were followed and controlled throughout the study. Eleven-gm. samples of meat were taken from the raw ground beef or the meat loaf at the various stages and mixed in a Waring Blendor with 99 ml. phosphate buffer solution (7) for 1 min. Serial dilutions were plated on tryptone glucose extract agar (TGE) and counted after incubation at 37°C. for 48 hr., except that media selective for streptococci were incubated at 45°C.

SERIES 1—UNINOCULATED MEAT LOAVES

Meat loaf sufficient for four family-sized loaves was made with the following ingredients: 2⅔ cups dry bread crumbs, 4 cups milk, 6 lb. ground beef, 8 beaten eggs, 4 t. salt, 4 t. sage, and a dash of pepper. The bread crumbs were prepared several days in advance and stored in a covered container in the refrigerator. The ground beef, milk, and eggs were purchased the day used. A sample of each lot of beef was removed for bacteriologic examination. Preliminary studies indicated this was not necessary for the other ingredients. After soaking the bread crumbs in milk, the meat, eggs, and seasonings were added and all ingredients were mixed thoroughly by hand. This mixture was divided equally into four portions and placed in loaf pans 8½ by 4½ by 2½ in. A thermometer was placed in the center of each loaf, and beginning temperatures were recorded. Each loaf was covered with clear, self-sealing paper during holding.

Three replications of each treatment, totalling forty-eight family-sized loaves, were included in Series 1.

Four holding conditions were used: (a) mixture brought to room temperature (68°F.) and placed in

[1] Contribution from Montana State College, Agricultural Experiment Station. Paper No. 375 Journal Series. Received for publication February 27, 1956.

an oven at room temperature; (b) brought to room temperature and placed in a warm oven (starting temperature 150°F. and then oven shut off); (c) brought to refrigerator temperature (55°F.) and placed in oven at room temperature; and (d) brought to refrigerator temperature and placed in warm oven. These conditions approximate those which might be encountered in preparing meat loaves for cooking in automatic ovens. Bacterial tests were made: when mixture reached holding condition, and at 1-, 2-, 3-, 4-, and 8-hr. periods prior to cooking. After the loaves had been held the desired length of time, a thermocouple[2] was placed in the center portion of the loaf near the thermometer and the pan was placed in a 400°F. oven for cooking.

Time and meat-loaf temperatures were recorded for each part of the various holding treatments as well as the loaf temperature at 10-min. intervals during cooking. Loaves were cooked to an internal temperature of 160°F. (medium doneness), and a sample was removed immediately for bacteriologic testing.

The data were treated statistically according to the analysis of variance (Ostle [8]).

SERIES 2—INOCULATED MEAT LOAVES

From each meat loaf mixture in this series, one loaf was left uninoculated as a control; a second was inoculated with *Micrococcus pyogenes* var. *aureus*[3]; a third with *Streptococcus faecalis*[3]; and a fourth with *Salmonella typhimurium*.[4] The loaves were brought to room temperature and held for 4 or 8 hr. before cooking. Findings in Series 1 in which loaves were brought to refrigerator temperature and held for 1, 2, and 3 hr. were not significantly different from those held 4 hr., hence such runs were not included in this series. There were two replications of each holding treatment prior to baking, making a total of thirty-two loaves.

For the inoculation work, 24-hr. cultures of each test organism grown on TGE agar slants were suspended in 40 ml. phosphate buffer solution. Five ml. of this solution were used to inoculate each meat loaf (1000 gm.). This gave approximately 5 million cells of *M. pyogenes* var. *aureus*, 40,000 cells of *S. faecalis*, and 3 million cells of *S. typhimurium* per gram of meat loaf mixture.

Along with the standard plate counts on TGE agar, samples from the inoculated loaves were also plated quantitatively on selective media—*M. pyogenes* var. *aureus* on TGE agar with 10 per cent sodium chloride as suggested by Castellani *et al.* (9); *S. faecalis* on *SF* (*Streptococcus faecalis*) broth (Bacto) plus 1.5 per cent agar; and *S. typhimurium* on *SS* (*Salmonella-Shigella*) agar (Bacto).

After cooking and sampling, loaves were covered and held at room temperature or in the refrigerator for 18 to 24 hr. to determine the type and numbers of surviving organisms. Both methods of storing cooked meat loaves are sometimes used in the home.

Results and Discussion

SERIES 1—UNINOCULATED MEAT LOAVES

In Table 1 are shown the logarithms of the average numbers of bacteria per gram of raw beef, the meat loaf after reaching holding temperature, and after holding under conditions *a*, *b*, *c*, and *d* for 1, 2, 3, 4, and 8 hr., and immediately after cooking. Variations in counts due to the different holding temperatures were small and not statistically significant.[5] When the loaves were held for 4 hr., the organisms were in the lag phase of growth. It appears that the logarithmic growth phase was approached or reached between the fourth and eighth hours of holding, since bacteria increased 10 to 100 times. Cooking the meat loaves to an internal temperature of 160°F. significantly reduced the bacteria to several hundred per gram, regardless of the numbers found prior to cooking.

The internal temperatures of the meat loaves after reaching holding temperature, after holding 4 and 8 hr., and immediately after cooking are shown in Figure 1. Jensen (1) reports that the micrococci, which cause 90 per cent of the food poisoning outbreaks, do not form toxin unless growing rapidly. To grow rapidly, they must be in the potential "danger zone" of 50° to 120°F. for more than 4 hr. and in a suitable medium. In this study, the meat loaves brought to room temperature, held 4 hr. at either room temperature or in a warm oven (starting temperature 150°F.), and then cooked were in this zone approximately 6 hr. Loaves brought to refrigerator temperature and held 4 hr. in ovens at both temperatures were in the "danger zone" 3 to 6 hr. These periods included the time needed to bring them to 68°F. and the first part of the cooking period.

If only the temperature chart (*Fig.* 1) were examined, it might be concluded that the time during which these meat loaves were in the "danger zone" proximates too closely for safety the minimum of 4 hr. in which toxin might develop. However, the organisms were in the lag phase of growth and not multiplying rapidly (Table 1) during this 3- to 6-hr. period, and it is unlikely that toxin would develop in these meat loaves.

Based on this information obtained with the uninoculated loaves, it would seem that, under the ex-

[2] Obtained from J. B. T. Instruments, Inc., New Haven 8, Connecticut.

[3] Cultures of *Micrococcus pyogenes* var. *aureus*, strain 210, and *Streptococcus faecalis*, strain R5, were supplied through the courtesy of Dr. C. F. Niven, Jr., American Meat Institute Foundation, University of Chicago.

[4] Culture of *Salmonella typhimurium* was supplied through the courtesy of Dr. J. L. Stokes, Western Utilization Research Branch, Agricultural Research Service, Department of Agriculture, Albany 10, California.

[5] Calculations were performed in the Statistical Laboratory, Montana State College.

TABLE 1

*Logarithms of average number of bacteria per gram raw beef, raw meat loaves held under different conditions, and meat loaves after cooking**

HOLDING TREATMENT	BACTERIA PER GRAM†										
	Raw beef and raw meat loaves held up to 4 hr. and then cooked							Raw beef and raw meat loaves held 8 hr. and then cooked			
	Raw beef as purchased	Raw meat loaf mixture					Meat loaves cooked after 4 hr. holding‡	Raw beef as purchased	Raw meat loaf mixture		Meat loaves cooked after 8 hr. holding‡
		No holding after mixture reached holding temperature	1 hr. holding before cooking	2 hr. holding before cooking	3 hr. holding before cooking	4 hr. holding before cooking			No holding after mixture reached holding temperature	8 hr. holding before cooking	
Brought to room temperature and held at room temperature	6.1	6.3	6.4	6.5	6.7	6.7	3.2	6.6	6.6	7.7	2.6
Brought to room temperature and held in warm oven	6.4	6.1	—	—	6.6	6.7	2.3	6.6	6.6	8.1	2.3
Brought to refrigerator temperature and held at room temperature	6.4	6.4	6.2	6.2	6.3	6.3	2.6	6.6	6.6	7.8	2.2
Brought to refrigerator temperature and held in warm oven	6.4	6.4	—	—	6.5	6.7	2.5	6.6	6.6	8.5	2.7

* Averages of three replications.

† Plated on tryptone glucose extract agar.

‡ Tested immediately after removal from oven.

perimental conditions of this study, such meat loaves might be held for 4 hr. prior to cooking without danger of food poisoning. This assumption should not, however, be extended to other foods, such as casserole dishes, until additional experimental evidence is obtained.

Since under certain circumstances a meat loaf might be placed in an automatically-time-controlled oven at 8 or 9 a.m. with the oven set to turn on at 4 or 5 p.m. to cook the food for the evening meal, loaves were also held for 8 hr. Loaves brought to room temperature, held 8 hr. at either room temperature or in a warm oven, and then cooked were in the "danger zone" approximately 9 hr. (*Fig.* 1). Loaves brought to refrigerator temperature and held 8 hr. in ovens at both temperatures were in this zone 7 to 8 hr. Bacteria determined at the end of the 8-hr. period showed a 10- to 100-fold increase. On the basis of earlier findings, it appears likely that most of the multiplication occurred during the last 4 hr. of holding. This was confirmed when meat loaves were held for 8 hr. under different conditions and the organisms determined after 4, 5, 6, 7, and 8 hr. (*Fig.* 2). Thus these meat loaves were held in the temperature "danger zone" for considerably more than the minimum 4 hr. and the organisms were multiplying rapidly—both conditions being suitable for toxin formation by micrococci. Therefore, it is not recommended that ground beef meat loaves be held at room temperature or above for a period of 8 hr. prior to cooking. These recommendations are made on the basis of the potential development of thermostable bacterial toxins and not on the presence of live organisms in the cooked meat loaves. Bac-

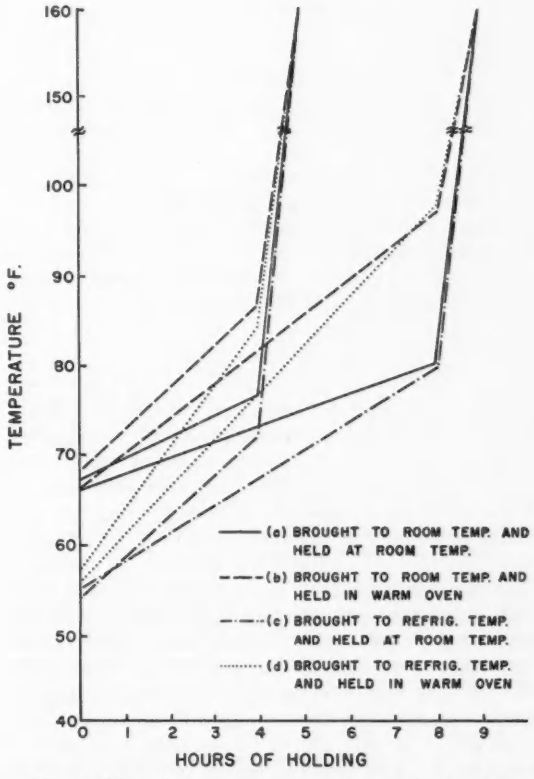

Fig. 1. Mean internal temperatures of meat loaves after 4 and 8 hr. holding under various conditions, and after cooking.

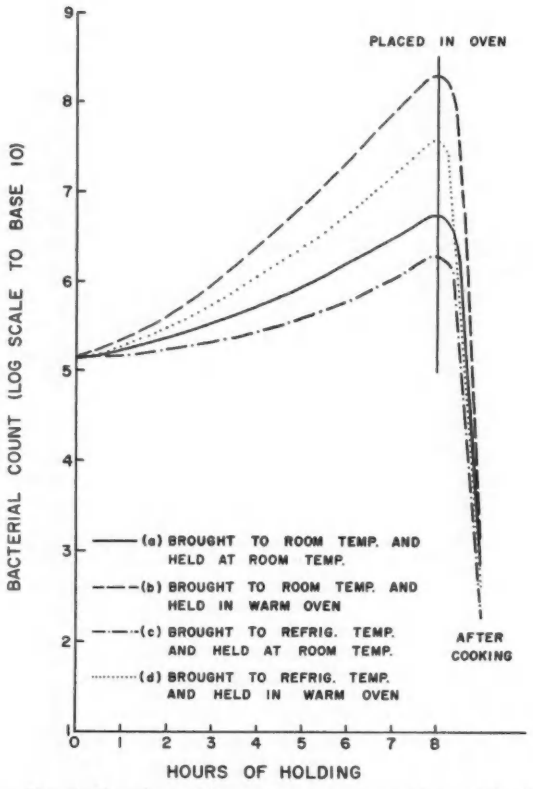
PLACED IN OVEN
BACTERIAL COUNT (LOG SCALE TO BASE 10)
(a) BROUGHT TO ROOM TEMP. AND HELD AT ROOM TEMP.
(b) BROUGHT TO ROOM TEMP. AND HELD IN WARM OVEN
(c) BROUGHT TO REFRIG. TEMP. AND HELD AT ROOM TEMP.
(d) BROUGHT TO REFRIG. TEMP. AND HELD IN WARM OVEN
AFTER COOKING
HOURS OF HOLDING

Fig. 2. Number of bacteria per gram of meat loaf after holding 4, 5, 6, 7, and 8 hr. and after cooking.

terial counts shown in Table 1 indicate major destruction of the organisms by baking.

Since the presence of toxin in meat loaves is hard to demonstrate, the final evaluation of potential danger must be based on bacterial counts and internal temperatures of the loaves as previously discussed.

SERIES 2—INOCULATED MEAT LOAVES

The average number of bacteria obtained with uninoculated (control) or with inoculated meat loaves when plated on TGE agar were not significantly different (Table 2). Internal temperatures of the loaves were similar to those found in Series 1 (*Fig.* 1).

Control Loaves

In the control loaves, the numbers of micrococci and other organisms capable of growing in the TGE agar plus 10 per cent salt were only slightly lower than those obtained at the start when TGE agar was the plating medium (Table 2). In addition, greater increases in counts were noted on the TGE agar after 4- and 8-hr. holding. The numbers of streptococci and salmonellae in the uninoculated loaves were low and showed only slight increases following an 8-hr. holding period. After cooking, no micrococci, streptococci, or salmonellae organisms were encountered.

Loaves Inoculated with Micrococci

The culture of *M. pyogenes* var. *aureus* used was coagulase-positive. According to Evans, Buettner, and Niven (10), any food containing large numbers of coagulase-positive staphylococci should be considered dangerous for human consumption.

The addition of micrococci to the meat loaves increased the numbers of bacteria about 10-fold, whether TGE agar or the selective medium of TGE agar plus salt was employed for plating. Holding the loaves for 4 hr. caused little increase in the bacterial population, whereas after 8 hr., the numbers had multiplied to approximately 100 million cells. Baking reduced the numbers to about 100 organisms per gram meat loaf.

Even though the inoculated meat loaves were held for 8 hr. in the "danger zone" temperature and at the end of this time had several million micrococci per gram, thirteen kittens fed samples of these meat loaves (both before and after cooking) showed no symptoms of food poisoning. However, there is lack of agreement concerning the validity of the kitten test, since man has been found to react to smaller amounts of enterotoxin than does the kitten (11). Hence, a negative kitten feeding test does not necessarily indicate that the loaves were safe for human consumption.

Loaves Inoculated with Streptococci

The number of streptococci obtained when the raw beef was plated on SF agar varied between 100 and 10,000 per gram, whereas after mixing and inoculation the counts varied between 10,000 and 100,000 (Table 2). There were some increases after the 4-hr. holding, but after 8 hr., the number of organisms developing in the selective medium were in the range of 10 to 100 million. Cooking reduced the numbers of all organisms to about 100 per gram and eliminated all streptococci when an internal temperature of 160°F. was reached. This is in agreement with Jensen's findings (5) that this type of organism is killed under pasteurization conditions (160°F. for 15 seconds or 143°F. for 30 min.). Although the role of streptococci in food poisoning is uncertain, it is likely that a large number of these organisms would be necessary to cause streptococcus food poisoning. However, the complete destruction of these organisms by baking to 160°F. makes the possibility of food poisoning by streptococci in meat loaves seem unlikely.

Loaves Inoculated with Salmonellae

The meat loaf medium was unfavorable for the growth of *S. typhimurium*, as the counts on SS agar decreased during both holding periods (Table 2). However, the increases in the numbers of other or-

TABLE 2

*Logarithms of average numbers of bacteria per gram raw beef, uninoculated and inoculated raw meat loaves held under different conditions, and meat loaves after cooking**

PLATING MEDIUM	HOLDING TEMPERATURE	BACTERIA PER GRAM							
		Raw beef and raw meat loaves held 4 hr. and then cooked				Raw beef and raw meat loaves held 8 hr. and then cooked			
		Raw beef as purchased	Raw meat loaf mixture		Meat loaves cooked after 4 hr. holding†	Raw beef as purchased	Raw meat loaf mixture		Meat loaves cooked after 8 hr. holding†
			No holding after mixture reached holding temperature	4 hr. holding prior to cooking			No holding after mixture reached holding temperature	8 hr. holding prior to cooking	
Control Samples—No Inoculation									
TGE‡	room temperature	5.5	5.8	6.0	2.1	5.8	5.4	8.0	2.3
	warm oven	5.2	5.3	6.3	1.5	5.8	5.5	7.4	1.1
TGE + 10% NaCl	room temperature	5.1	5.8	5.0	2.2	5.2	4.7	5.7	1.0
	warm oven	4.7	4.7	4.9	1.2	5.2	5.3	5.3	1.2
SF agar #	room temperature	2.2	2.3	2.8	0	2.2	2.5	3.5	0
	warm oven	2.5	2.4	2.7	0	3.9	2.8	4.3	0
SS agar¶	room temperature	2.8	2.9	2.7	0	3.2	3.1	3.3	0
	warm oven	2.8	2.9	3.4	0	3.3	2.8	3.2	0
Inoculation with *Micrococcus pyogenes* var. *aureus*									
TGE	room temperature	6.2	6.7‖	6.9	2.6	5.6	6.7‖	7.9	1.2
	warm oven	5.8	6.8	7.0	1.9	5.7	6.8	8.2	2.4
TGE + 10% NaCl	room temperature	5.1	6.4	6.8	2.4	5.2	6.5	7.3	0.7
	warm oven	4.7	6.5	6.9	1.9	5.2	5.8	7.7	1.7
Inoculation with *Streptococcus faecalis*									
TGE	room temperature	6.2	5.5	6.0	2.4	5.6	6.1	8.3	2.6
	warm oven	5.8	5.7	6.2	2.0	5.7	5.7	7.5	1.7
SF agar	room temperature	2.2	4.0	4.6	0	2.2	4.9	8.1	0
	warm oven	2.5	4.6	5.8	0	3.9	4.8	7.2	0
Inoculation with *Salmonella typhimurium*									
TGE	room temperature	5.7	6.5	6.8	1.2	5.8	6.6	8.5	1.2
	warm oven	5.7	6.6	7.1	2.3	5.9	6.6	8.5	3.7
SS agar	room temperature	2.8	6.2	4.7	0	3.2	6.5	5.8	0
	warm oven	2.8	6.3	4.4	0	3.3	6.5	6.3	0

* Two replications.
† Tested immediately after removal from oven.
‡ Tryptone glucose extra agar.
# *Streptococcus faecalis* broth plus 1.5% agar.
¶ *Salmonella-Shigella* agar.
‖ Inoculation started at this point.

ganisms in these loaves as determined by the TGE agar were similar to the increases previously obtained. As with the streptococci, salmonellae are destroyed by pasteurization (5), and cooking these meat loaves to an internal temperature of 160°F. eliminated *Salmonella typhimurium*, thus making the likelihood of contracting this type of food poisoning from properly cooked meat loaves quite remote.

Loaves Held after Cooking

Since meat loaves are not always eaten immediately after cooking, changes in the microbial population during storage under different conditions were investigated. Bacterial counts of the cooked loaves, both inoculated and uninoculated, held in the refrigerator 18 to 24 hr. showed practically no increase. When other loaves were held for similar periods at room temperature, there was an increase in total counts from a few hundred to several million. The predominating organisms were identified as sporeformers and micrococci. Because of the presence of the latter, holding cooked meat loaves for extended periods at room temperature cannot be recommended.

Summary

The effect of delayed cooking of meat loaves was investigated by determining the numbers of bacteria in raw ground beef, in meat loaves after mixing but before and after holding under various conditions in automatic ovens, and immediately after cooking. In addition, meat loaves were inoculated with *Micrococcus pyogenes* var. *aureus*, *Streptococcus faecalis*, and *Salmonella typhimurium*.

Meat loaves with approximately 1 million bacteria at the start showed little increase after holding for 4 hr. at room or oven temperatures but showed an increase of 10- to 100-fold at the end of 8 hr. Increases and variations in bacterial counts due to the different holding conditions were not significant.

Samples from inoculated meat loaves were plated on selective media. Micrococci and streptococci increased slightly after 4 hr. but 100 to 1000 times at the end of 8 hr. Salmonellae decreased during holding. All streptococci and salmonellae were destroyed when the meat loaves were cooked to an internal temperature of 160°F., and the numbers of micrococci were reduced from about 10 million to less than 100 per gram.

Internal temperatures of the meat loaves held 4 to 8 hr. under the various conditions were within the "danger zone" temperature of 50° to 120°F., where bacterial multiplication may be rapid, for 3 to 9 hr. From these results, it would appear safe to hold meat loaves for 4 hr. prior to cooking since there were no appreciable increases in numbers of bacteria. However, since there was a potential danger of thermostable micrococcus enterotoxin production if loaves were held 8 hr. before cooking, this procedure is not recommended.

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The Nurse-Dietitian Team

A common professional bond between the doctor and the nutritionist or dietitian is the nurse. The nurse in name, tradition, and function clearly symbolizes the intimate tie between food and emotional human relationships. It was not too long ago that the medicine prescribed and the orders written by the doctor for the nurse involved primarily food and the feeding of that food to the patient. It is still an intimate and necessary part in the treatment of the sick, in spite of the recent advances in chemotherapy, antibiotics, etc.

One rather characteristic personality trait of those who become sick is, in varying degrees, to turn back to the days of childhood. There is a desire in the sick person to have those days which were safe and pleasant with the parent, when he was mothered and fed. This must be taken into consideration, even when it is decided that the diseased body needs specific food elements. These elements must be administered with the emotional needs in mind.

The nurse is in the perfect position to administer these with the warmth of the mother figure. It is for this reason that the dietitian and the nurse must constantly work together to provide the physical needs of the patient therapeutically combined with the emotional needs. I do not imply that the nutritionist has any less responsibility in the emotional sphere; it is always a combined effort. Her personal visits to the ward combine and add emotional qualities to the diet tray. The attractiveness of her tray and the taste of the food add a quality of pleasure in taking in the needed nutritional elements.

Feeding people anywhere—in hospital, dormitory, or home—must be done with true positive feeling and emotional understanding of the people being fed. It can never be wholly effective if done in a mechanical way. With insight into this premise, both the nurse and the nutritionist will gain so much more personal satisfaction from preparing food and administering it.—*Extracted from "The Emotional Meaning of Food" by James A. Johnson, M.D. The Wisconsin Dietitian 6: 5 (October), 1955.*

Composition of Turkey Meat[1]

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IN PLANNING diets for hospitals, schools, or for any purpose, it is essential that the dietitian have accurate, up-to-the-minute information concerning not only the caloric but also the protein and other nutrient content of the foods being used to compound the diets.

Because turkey meat has become an important part of such diets and since improvements during the past few years in the breeding and feeding of turkeys have resulted in further improvements in the protein content of turkey meat, it was considered desirable to re-evaluate turkey meat in terms of protein, fat, moisture, ash, and physiologic fuel value.

Earlier studies on this subject were conducted by Harshaw and co-workers (1) in 1940 and 1941. Comparison of photographs of the birds used in their studies with representative turkeys used in this study indicate a marked improvement in body conformation over the past fifteen years.

The nutrient value of present-day turkeys, together with tables showing how turkey meat ranks in relation to other meats, is presented in this report.

Plan of Procedure

Groups of fifty male and fifty female turkeys representing each of three turkey varieties (Broad Breasted Bronze, Broad Breasted White, and Beltsville Small White) were grown from day-old poults to market weight turkeys under good environmental conditions. The turkeys received good turkey rations. Five representative turkeys from each group were slaughtered, dressed, roasted, and analyzed for nutrient composition at appropriate marketable ages during the growth period. The ages selected for slaughtering were those generally used for marketing turkeys as (a) turkey "broilers", (b) young adult turkeys, and (c) mature turkeys. The exact ages are indicated in the tables.

[1] This work was supported in part by the National Turkey Federation, Mount Morris, Illinois. Received for publication April 26, 1956.

Methods of Analysis

The oven-ready carcasses were roasted until well done using low temperatures (250° to 300°F.) to preserve natural moisture (according to the recommendations of the College of Home Economics, Cornell University), whereupon all of the edible portion was removed from the skeleton and then dried to constant weight in a frozen state in a Stokes Desivac. Accurate records were kept of moisture losses during cooking and during drying in the Desivac. The amount of fat lost in the drippings during the cooking process was also measured by drying off the moisture in an oven at 105°C. after removing the cooked bird from the pan, thus determining the fat and moisture in the drippings by difference. The

TABLE 1

Dressing percentages for turkeys

SEX	AGE	LIVE WEIGHT	PER CENT LIVE WEIGHT			
			New York dressed	Oven ready	Edible portion	
					Raw	Roasted
Broad Breasted Bronze Turkeys						
	wk.	*lb.*				
Male	12	8.96	87.5	73.7	56.0	27.1
	20	19.22	86.3	72.2	58.1	31.8
	26	26.54	93.4	77.7	57.2	45.9
Female	12	6.76	87.6	75.0	58.9	35.4
	18	12.51	89.8	77.2	61.9	39.2
	24	15.90	91.2	76.7	59.7	45.5
Broad Breasted White Turkeys						
Male	12	9.54	86.3	74.0	55.9	35.6
	20	18.14	90.6	75.7	61.6	33.4
	26	25.54	91.6	75.9	57.1	44.0
Female	12	7.40	84.3	71.9	56.9	38.8
	18	11.26	87.4	72.8	59.3	38.4
	24	13.84	92.8	78.1	59.1	46.4
Beltsville Small White Turkeys						
Male	12	7.46	86.1	71.0	53.4	32.8
	20	15.20	86.8	73.6	60.4	32.1
Female	12	5.89	85.6	72.2	55.7	32.1
	20	9.28	85.7	72.1	61.1	32.4

dried edible portion was ground in a "hamburger type" meat grinder and then finely ground (with dry ice) in a Fitzpatrick Model M comminuting machine using a 2 mm. screen, thereby producing the final samples used for analysis. All analyses were conducted in triplicate and were rerun whenever the three analyses failed to check within ±2 per cent of the mean.

Total nitrogen was determined according to the Kjeldahl method as outlined by the Association of Official Agricultural Chemists (2) using 1-gm. samples of the dried edible portion for each analysis. The nitrogen values were converted to crude protein by multiplying these values by 6.25. Ether extract, moisture, and ash were also determined by the official methods of the AOAC, except that 5-gm. samples were used in all of these analyses.

Riboflavin was determined by the fluorometric method of Scott *et al.* (3), and niacin was determined by the microbiologic method as described in *Methods of Vitamin Assay* (4), except that 2 N sodium hydroxide instead of 1 N sulphuric acid was used to extract the niacin from the samples. This modification of the niacin method was used because our experience has been that it produces higher and more reproducible niacin values.

Yield of Meat

The dressing percentages and meat yields from each variety of turkey at various ages are presented in Table 1. The amount of roasted, ready-to-eat meat obtained from a live turkey was very high, amounting to approximately 45 per cent of the live weight of the mature broad breasted turkeys. It is of interest that the yield of cooked edible meat obtained increases as the turkeys grow older. This indicates that the amount of meat laid down as the turkey grows increases at a faster rate than the increase in bone and inedible viscera. The dressing percentages shown here are in excellent agreement with those obtained previously by Harshaw *et al.* (1), thus confirming that the improved body conformation achieved during recent years has not been at the expense of dressing yields.

TABLE 2

Composition of various meats

MEAT	PROTEIN†		FOOD ENERGY*†		MOISTURE†		FAT†		ASH†	
	Raw	Roasted	Raw	Roasted	Raw	Roasted	Raw	Roasted	Raw	Roasted
	%	%	*calories/ 100 gm.*	*calories/ 100 gm.*	%	%	%	%	%	%
Turkey										
12 wk. BBB, male	19.2	31.6	105	180	75.7	61.2	4.1	6.0	0.73	1.20
20 wk. BBB, male	20.8	40.6	126	218	74.6	51.9	4.8	6.2	0.76	1.49
26 wk. BBB, male	21.1	26.6	207	232	64.4	58.2	13.6	14.0	1.05	1.04
12 wk. BBB, female	19.2	31.5	104	181	75.9	61.1	4.1	6.1	0.76	1.24
18 wk. BBB, female	18.9	29.9	175	234	69.5	56.5	11.1	12.7	0.69	1.08
24 wk. BBB, female	20.0	25.7	229	242	62.2	57.4	16.6	15.4	0.77	0.98
12 wk. BBW, male	19.8	31.4	117	176	75.2	61.9	4.2	5.6	0.77	1.22
20 wk. BBW, male	19.5	37.1	126	204	74.5	55.3	5.3	6.2	0.75	1.43
26 wk. BBW, male	22.2	28.5	174	199	67.6	61.0	9.5	9.4	1.09	1.09
12 wk. BBW, female	20.3	29.9	130	181	73.7	62.4	5.4	6.8	0.82	1.20
18 wk. BBW, female	19.6	30.6	156	209	71.1	58.6	8.6	9.7	0.79	1.24
24 wk. BBW, female	22.1	27.6	182	201	66.3	60.7	10.4	10.1	0.87	1.09
12 wk. BSW, male	21.1	35.0	117	185	74.5	58.8	3.6	5.0	0.75	1.23
20 wk. BSW, male	19.2	37.5	144	235	72.7	51.7	7.5	9.4	0.67	1.30
12 wk. BSW, female	19.6	34.8	136	225	73.5	54.8	6.4	9.3	0.71	1.26
20 wk. BSW, female	18.5	35.8	173	282	67.8	45.4	11.0	15.4	0.66	1.26
Chicken										
13 wk. broilers, male	18.2	24.5	129	154	74.8	68.3	6.2	6.2	0.78	1.04
13 wk. broilers, female	17.7	24.5	143	175	73.4	71.8	8.0	8.5	0.78	1.04
18 wk. roasters, female‡	20.2	—	200	—	66.0	—	12.6	—	1.0	—
Ducks (White Pekin)—8 wk., male and female	10.9	—	366	—	52.7	—	35.8	—	0.4	—
Beef‡—medium fat carcass, trimmed to retail	18.2	—	240	—	63.0	—	18.0	—	0.9	—
Lamb‡—medium fat	15.7	—	317	—	55.8	—	27.7	—	0.8	—
Pork‡—medium fat	11.9	—	457	—	42.0	—	45.0	—	0.6	—

* Calculated by considering the protein and fat to contain 4 and 9 calories per gram, respectively.

† Total edible portion.

‡ For source of these data, see reference (5).

Composition of Edible Portion of Turkeys

Since turkey and chicken, unlike steer, hog, or lamb, are usually cooked and served as a whole, dressed animal, it appeared desirable to present to the dietitian, not only the separate nutrient values for the various parts of the turkey, but also the nutrient analyses for the complete edible carcass, so that calculations and cost comparisons can be made at the time the oven-ready turkey is purchased. Data on the nutrient composition of the total edible portion of raw turkey are presented in Table 2. For comparative purposes similar data on the nutrient composition of the raw edible portion of other meat animals are also presented.

The protein content of turkeys was very high amounting to 20 to 22 per cent of the total edible portion in the mature broad breasted varieties. The fat content increased with age, especially between the period marking the first stage of maturity and the completely mature stage.

Data showing the nutrient composition of the total edible portion of turkeys after roasting are also presented in Table 2. In the roasted meat, the protein increased and the moisture decreased, but the fat content was approximately the same, when compared with the levels of these nutrients in the raw carcass. The comparable amount of fat is explained by the loss of some fat in the drippings along with the loss of moisture during cooking.

Protein and Calories of Turkey and Other Meats

In the final analysis, the dietitian must know the amount of protein, energy, and other nutrients being supplied by each cooked serving of each of the foods used in the menu. This information for turkey meats is presented in Table 3, together with data showing how turkey meats rank in relation to other meats as sources of protein and other nutrients. Both the breast meat and the leg meat of roasted turkey rank higher in protein than any of the other cooked meats.

Even though turkey meats contain sufficient fat for tenderness and palatability, their caloric content is not unduly high. In terms of calories per 100 gm. cooked meat, turkey breast and leg meats are com-

TABLE 3

Comparison of nutrient composition of turkey and other meats

MEAT	PROTEIN	FOOD ENERGY	CALORIE: PROTEIN RATIO	FAT	MOISTURE	ASH	RIBOFLAVIN	NIACIN
	%	*calories/100 gm.*	*calories: 1% protein*	%	%	%	*mg./100 gm.*	*mg./100 gm.*
Turkey*								
Roasted and boned								
Breast (white meat)								
Male	33.5	194	5.8	6.7	59	1.1	0.42	9.4
Female	35.0	215	6.1	8.3	56	1.1	0.38	11.6
Leg (dark meat)								
Male	30.8	224	7.3	11.2	57	1.0	0.94	4.1
Female	30.3	230	7.6	12.1	56	1.0	0.86	4.1
Skin	17.7	375	21.2	33.8	45	1.0	—	—
Edible viscera								
Male	23.5	200	8.5	14.0	61	1.6	3.15	—
Female	17.8	254	14.3	20.3	61	1.2	2.28	—
Smoked and boned								
Breast	31.0	207	6.7	9.2	57	2.8	0.23	—
Leg	30.2	221	7.3	11.1	56	2.8	0.47	—
Chicken, roasted and boned†								
Breast	31.5	138	4.4	1.3	66	1.0	0.30	10.5
Leg	25.4	168	6.6	7.3	67	0.9	0.60	5.6
Veal cutlet, cooked and boned‡	28.0	219	7.8	11.0	60	1.4	0.28	6.1
Beef, cooked and boned‡								
Round steak	27.0	233	8.6	13.0	59	1.3	0.22	5.5
Porterhouse steak	23.0	342	14.9	27.0	49	1.1	0.18	4.7
Rump roast	21.0	378	18.0	32.0	46	0.5	0.15	3.1
Hamburger	22.0	364	16.5	30.0	47	1.1	0.19	4.8
Pork—fresh, boned and cooked‡								
Ham	24.0	400	16.7	33.0	42	1.2	0.24	4.7
Loin chops	23.0	333	14.5	26.0	50	1.2	0.24	5.0
Lamb, cooked and boned‡								
Rib chops	24.0	418	17.4	35.0	40	1.2	0.26	5.6
Shoulder roast	21.0	342	16.3	28.0	50	1.0	0.22	4.6

* Data for mature turkeys. Younger turkeys would have less fat and calories and more protein.

† Data for 16-week-old roasting females.

‡ Data taken from reference (5).

parable to veal and round steak, are higher than the meats of young chicken roasters, but are much lower than all other meats listed. In terms of the number of calories in each 1 per cent of protein supplied (calorie:protein ratio), which may be a more significant value to be considered in choosing foods for reducing diets, turkey breast and leg meats show a lower ratio than any other meat with the exception of the young chicken roaster.

Niacin and Riboflavin

To obtain information indicative of the vitamin content of roasted turkey meat relative to other meats, riboflavin and niacin were determined on the breast and leg meat of several lots of turkeys. The results of these analyses, presented in Table 3, show that roasted turkey breast and leg meats contain one and a half to three times as much riboflavin and niacin as has been reported in most of the other cooked meats.

Summary and Conclusions

Data are presented on the dressing percentages and nutrient composition of the edible portions of raw and roasted turkeys of various varieties and ages as compared to other meats.

The breast and leg meats of roasted turkey rank higher in protein than any of the other cooked meats.

The caloric content of turkey breast and leg meats is comparable to that of veal and round steak, higher than that of young chicken roasters, but much lower than that of all other meats considered.

Roasted turkey breast and leg meats were also found to contain one and a half to three times as much riboflavin and niacin as most of the other cooked meats. Thus, the turkey appears to concentrate desirable nutrients in its meat.

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Impact of the Atomic Age on Food

That the atom has and will affect our lives is no longer news. However, facets of the problem as they will affect our food supplies and agriculture are only now being realized, as indicated by the recent report on *The Biological Effects of Atomic Radiation* released by the National Academy of Sciences—National Research Council.

A special Committee on Agriculture and Food Supplies finds that radiation techniques are of great potential value in research, but it does not believe that they are leading to any drastic or imminent improvement in agricultural production. Researchers are now using radiation to increase mutation rates in plants for the purpose of developing new and improved varieties. However, these techniques are not so likely to be useful in improving animal breeds, since farm animals, because of their size, cost, and the time required to breed each generation, make such experiments less practicable. Probably only poultry and perhaps swine could be handled in sufficiently larger numbers, and even here, judging from work with smaller laboratory animals, the chances of improvement seem slim.

The "natural content" of radioactive elements in foods now consumed by animals and man is not the same as in the pre-atomic age. Though extremely small, the difference is measurable and inescapable. Fallout from weapons tests has added radioisotopes which were not there before to air, soil, and water. The radioactive elements are taken up by crops through the roots and also directly through the leaves. However, the Committee believes that the slowly rising background of radiation caused from this source in peacetime is not likely to impair or interfere with food production. On the other hand, levels resulting from atomic warfare or from mishaps with nuclear power plants in peacetime could have catastrophic effects on agricultural production. In case of severe contamination, strontium 90 would cause the most concern. There appears to be no way of preventing its accumulation in bone tissue. All available foods in heavily contaminated areas might contain significant levels of radio-strontium, perhaps for years.

At present it is not known at what level food becomes unwholesome because of radioactivity. There is not nearly enough information on the long-term biologic effects that may follow when men or animals eat radiation-contaminated food. The Committee therefore urgently recommends a long-range research program to investigate such areas as: distribution of radioactivity in the soil at various depths, in the vegetation, in the wild life, in the streams, and the possible influence of land use on the accumulated radioactivity in the soil. Forested land, range land, rotation grassland, and irrigated and non-irrigated plowland may each present a different situation.

Costs of Oven-Ready Beef from Carcass, Primal Cut, and Fabricated Sources[1]

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TODAY the successful food service operator must determine the best method of purchasing for his particular needs by carefully evaluating all available information. The conventional method of buying carcass beef has been supplemented by the purchasing of wholesale cuts and, more recently, by the purchasing of fabricated roasts and portion-ready items.

The food buyer plans his menus for immediate and effective utilization of all items from a shipment of carcass or primal cuts of beef. He must also carefully consider the dollar value of the remaining items, which may cause him to have "tied up" an amount of money ten times greater than the value of the menu item for which the shipment had been purchased.

This study was conducted to consider factors which influence the decision for buying beef in fabricated, carcass, or primal-cut state. The first objective was to determine variations in percentage yield of four oven-ready classifications from wholesale sections of carcasses and corresponding sections purchased as primal cuts. Grades used for this investigation included Commercial (old designation[3]), Good, and Choice. The four oven-ready classifications included cuts suitable for dry-heat roasting, pot roasting, stew meat, and ground beef. The second objective of the study was to compare the costs per pound of boneless meat of the four oven-ready items processed in the meat laboratory from carcass and primal cuts with the corresponding fabricated items.

A third objective was to consider factors other than direct meat and labor costs which influence the decision for buying fabricated beef, carcass, or primal cuts for institution use. These factors, which cannot be measured objectively, included problems in menu planning, complete utilization, and storage space.

Method of Procedure

Nine half-carcasses and thirty-six primal cuts including rounds, trimmed loins, ribs, and chucks were purchased for the cutting tests. Three half-carcasses and three of each of the primal cuts of the Commercial, Good, and Choice grades were used.

PREPARATION OF HALF-CARCASSES

On delivery, each half-carcass had been cut into quarters, with the thirteenth rib remaining on the hindquarter. Following seven days' storage at 35°F., the quarters were divided into wholesale cuts, Chicago style. The cuts from the hindquarter were: round, loin end, flank, and short loin. The forequarter was cut into: rib, short plate, chuck, and foreshank. Bones and fat were weighed and later sold as salvage. Their value was not deducted from the calculated costs of the oven-ready meat.

In the cutting tests, the round was divided into three oven-ready classifications. The inside or top round was cut into three approximately equal pieces for dry heat roasting. The outside or bottom round, which was cut lengthwise into two pieces, was included with the knuckle and the rump for pot roasting. The heel and shank meat were included with the meat to be ground.

The flank was removed from the full loin by cutting from the sirloin tip to the cartilage end of the thirteenth rib. The short loin was separated from the loin end at a line parallel to the rump end of the loin

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[3] Since this study was conducted and this paper written, the old Commercial grade of beef has been divided into two new grades, Commercial and Standard. The new Standard grade applies to younger animals with mild-flavored, rather tender meat but with little fat. The new Commercial designation applies to older animals.

TABLE 1

Conversion of list prices to factors

ITEM	SELECTED CAMPUS LIST PRICE	÷	COST OF GROUND BEEF*	=	FACTOR
Ground beef	$.36	÷	36	=	1.00
Stew meat	.46	÷	36	=	1.28
Pot roast	.52	÷	36	=	1.44
Dry-heat roast	.60	÷	36	=	1.67

* Arbitrarily chosen as constant factor.

TABLE 2

Method of obtaining total X Values

ITEM	YIELD	×	FACTOR*	=	X VALUES
	lb				
Dry-heat roast	58.12	×	1.67	=	97.07
Pot roast	25.25	×	1.44	=	36.36
Stew meat	76.12	×	1.28	=	97.44
Ground beef	40.56	×	1.00	=	40.56
Total X Values.....					271.43

* See Table 1.

at the tip of the pin bone. The sirloin butt, butt tender, the loin strip, and tenderloin were designated for dry-heat roasting. The lean meat from the flank was ground.

The rib section, which included the ribs six to twelve inclusive, was separated from the short plate approximately 7 in. from the backbone. The foreshank and brisket were detached from the chuck by a cut from a point 2 in. from the cartilage end of the fifth rib to a point just above the elbow joint on the arm bone. After all of the bones had been removed and trimmed, the entire chuck and the short plate were cut into pieces for stewing. The boneless rolled rib was designated for dry-heat roasting. The shank meat was ground, and the brisket meat was cut into stew meat.

PREPARATION OF PRIMAL CUTS

The rounds, loins, ribs, and chucks purchased as primal cuts were prepared for the cutting tests in the same manner as the corresponding carcass items.

FABRICATED CUTS

Fabricated beef was not actually purchased. To compare the cost of fabricated items of the four oven-ready classifications with the costs of items prepared in the meat laboratory, quotations were obtained from four regional wholesalers. The cost per pound of fabricated cuts used for comparison with the cost of items prepared from carcass and primal cuts was an average of these quotations.

COSTING OF OVEN-READY ITEMS

A price list prepared for use in the residence halls on the campus of Michigan State University was selected arbitrarily as a costing basis. Prices on this basic list included wholesale costs of the meat plus a specified percentage to cover service and processing expenses.

TABLE 3

Method of obtaining costs of remaining items

ITEM	GROUND BEEF VALUE	×	FACTOR	=	CALCULATED COST PER POUND
Stew meat	$.3173	×	1.28	=	$.4061
Pot roast	.3173	×	1.44	=	.4569
Dry-heat roast	.3173	×	1.67	=	.5299

According to their normal use in a food service activity, the four oven-ready classifications are not equal in value. Items suitable for dry-heat cooking are consistently more valuable and more costly than beef requiring moist heat for cooking.

To compare costs among the methods of purchase, a factor which allocated costs on the basis of the relative value of the four oven-ready classifications was necessary. The costs of the oven-ready items also depended on the percentage yield and the market price per pound paid for the half-carcasses and primal cuts. Factors were established from the selected campus price list by dividing the cost of each oven-ready item by the cost of ground beef, as shown in Table 1.

The total weight of each of the four oven-ready classifications was then multiplied by the respective factor to provide the *Total X Values* for every carcass and primal cut used. The method of obtaining the *X Values* is shown in Table 2. The dollar value of the carcass or primal cut was then divided by the total of the *X Values* to produce the monetary value of the ground beef for the particular animal. For example: Cost per pound of ground beef = $86.125 ÷ 271.43 = $.3173. Values of the three remaining oven-ready items were obtained by multiplying the monetary value of ground beef by the respective factors, as shown in Table 3.

The prices thus obtained were compared with the United States Department of Agriculture market quotations for the weeks during which each half-carcass and primal cut was purchased. The costs of the items, considering both grades and classifications, were very similar.

LABOR COSTS

The labor costs of the oven-ready meats were calculated from the average time required to prepare each item. The total preparation time included breaking, handling, and grinding times in addition to the actual cutting time. The proportion of time allocated to each oven-ready item was based on the ratio of the value of the item (weight multiplied by market price per pound) to the value of the total boneless meat from the wholesale cut. The wage costs for the cutting tests was calculated at $1.90 per hour.

TABLE 4

Percentage yield of oven-ready classifications from carcasess and primal cuts

GRADES AND CUTS	BILLED WEIGHT	SHRINKAGE	SALVAGE		CLASSIFICATION				
			Bone	Fat	Total boneless meat	Dry-heat roasts	Pot roasts	Stew meat	Ground beef
Carcasses									
	lb.	%	%	%	%	%	%	%	%
Commercial grade	564	0.69	18.65	9.13	71.52	21.93	8.75	27.94	12.90
Good grade	574	1.17	16.23	10.32	72.26	22.56	9.14	27.17	13.40
Choice grade	578	0.68	15.38	11.88	72.05	22.60	8.59	27.13	13.74
Primal Cuts									
Commercial grade									
Rib	37	0.34	19.67	6.57	73.40	68.28	—	—	5.12
Round	79	0.10	19.19	6.26	74.43	22.51	35.76	—	16.15
Full loin	63	0.33	13.20	17.31	69.14	58.32	—	—	10.82
Chuck	105	0.75	15.69	10.83	72.72	—	—	70.49	2.22
Good grade									
Rib	28	0.59	18.33	4.00	77.07	70.73	—	—	6.33
Round	83	0.91	17.72	7.54	73.82	21.23	35.52	—	17.06
Full loin	54	1.25	12.85	8.53	77.33	67.34	—	—	9.99
Chuck	96	0.87	16.44	8.29	74.39	—	—	72.12	2.26
Choice grade									
Rib	26	0.96	18.33	6.06	74.84	71.16	—	—	3.68
Round	80	0.67	17.56	9.50	72.26	21.05	35.65	—	15.54
Full loin	57	0.96	10.95	15.84	72.22	60.97	—	—	11.25
Chuck	83	0.20	14.76	14.53	70.76	—	—	68.64	2.12

Results and Discussion

PERCENTAGE YIELDS

The percentage yield of total dry-heat cuts was highest in the Choice grade and lowest in the Commercial grade carcass items. As shown in Table 4, 22.60 per cent of the total billed weight of Choice grade carcass beef was suitable for dry-heat roasting; in the Good grade animals, 22.56 per cent of the billed weight was suitable; in Commercial grade, the percentage was 21.93. Pot-roast percentage yield was highest in Good grade animals. However, the yields for Commercial and Choice grades of this item were only slightly less. Variations of yield for stew meat were also less than 1 per cent among grades of carcass. The highest percentage yield of ground beef among carcasses of the three grades was found in the choice grade animals.

The variation in percentage yield of bones in the three grades was greater than for any of the other components of the carcass. Fat composition among the three grades was inversely proportional to the bone composition. The combined percentages of the bone and fat were similar in all grades.

From primal cut sources, the yield of rolled rib was 2.88 per cent greater in Choice than in Commercial grade. Top round constituted a higher percentage of the total round in Commercial grade (22.51) than in Good (21.23) or in Choice grades (21.05).

The variation in the percentage yields of loins was greater than that of any of the other classifications. The yield of dry-heat roast from full loins, purchased as primal cut, was 67.34 per cent in Good grade, 60.97 per cent in Choice grade, and 58.32 per cent in Commercial grade. The variation of percentage yields of pot roast from primal cut rounds of the three grades was insignificant. The yield of stew meat in Good grade chuck was 72.12 per cent, which was 3.48 per cent more than the yield in Choice grade chucks.

COSTS PER POUND OF DIFFERENT GRADES

Among the oven-ready classifications of *Commercial* grade, only two items were most economical prepared from carcass beef. Strip loin from the carcass source (55.09 cents) was 29.74 cents per pound less than the fabricated strip loins and 18.97 cents per pound less than the item prepared from primal-cut sources. The cost per pound of ground beef prepared from carcass beef was slightly less than the primal cut source and the fabricated quotation, as shown in Table 5.

Commercial grade stew meat was prepared from the primal cut chuck at 4.88 cents less per pound than from the carcass beef and 9.96 cents less than the fabricated item. Rolled rib roast from the primal cut cost considerably less per pound than rolled rib from the other two methods of purchase. Fabricated top round, bottom round, and sirloin butt were quoted at prices below the costs of preparation of these items from the carcass and primal cuts.

Four oven-ready items of *Good* grade were prepared advantageously from carcass beef. Sirloin butt from carcass cost slightly less than the fabri-

TABLE 5

Effect of grade and method of purchasing on cost per pound of four classifications of boneless beef

ITEM	COST PER POUND								
	Commercial grade			Good grade			Choice grade		
	Carcass	Primal cut	Fabricated	Carcass	Primal cut	Fabricated	Carcass	Primal cut	Fabricated
Dry-heat roasts									
All types	$0.5502	$ —	$ —	$0.6632	$ —	$ —	$0.7161	$ —	$ —
Rib rolled	0.5501	0.3609	0.5783	0.6601	0.5635	0.6917	0.7160	0.6948	0.7483
Top round	0.5480	0.5713	0.4450	0.6704	0.7487	0.5200	0.7164	0.7692	0.4450
Sirloin butt	0.5519	0.7407	0.5150	0.6616	0.7690	0.6763	0.7156	1.0857	0.7313
Strip loin	0.5509	0.7406	0.8483	0.6608	0.7696	1.2213	0.7163	1.0823	1.3188
Pot roast	0.4752	0.4927	0.4500	0.5698	0.6456	0.6500	0.6172	0.6634	0.7000
Stew meat	0.4225	0.3737	0.4733	0.5068	0.5007	0.4650	0.5491	0.5334	0.4770
Ground beef	0.3297	0.3421	0.3388	0.3964	0.4484	0.4000	0.4284	0.4604	0.3775

cated item; strip loin was significantly less per pound from carcass than from the primal-cut short loin or the fabricated form. Bottom round and ground beef were also prepared from carcass beef at costs lower than from primal-cut or fabricated sources.

The rolled rib roast from primal cuts, at 56.35 cents per pound, was 9.66 cents less than comparable cuts from carcass sources and 12.82 cents less than the fabricated roast quotation. Quotations for fabricated top round and stew meat were considerably less than the costs of preparing these items from carcass and primal cut sources.

Sirloin butt, strip loin, and bottom round of *Choice* grade all cost less when prepared from carcass beef. At 71.56 cents per pound, the sirloin butt was 1.57 cents less than fabricated sirloin butt and 37.01 cents less than sirloin butt from primal-cut loins. Strip loin prepared from carcass was 36.60 cents and 60.25 cents per pound less than strip loin from primal cuts and fabricated loin. The differences in costs per pound of Choice grade bottom round were less marked; bottom round from carcass beef cost 4.62 and 8.28 cents less than pot roast from primal cuts and in fabricated form, respectively.

The rolled rib roast from primal cut rib sections, at 69.48 cents per pound, was 2.12 and 5.35 cents a pound less than carcass and fabricated rib roasts.

The top round purchased in fabricated form was significantly less per pound than this item from either the carcass or primal cuts. Fabricated stew meat and ground beef quotations were also lower than the costs per pound of these items prepared from carcass and primal cuts.

Among Grades

Several unusual relationships were noted when the costs per pound of the oven-ready classifications were compared between grades.

Rolled rib prepared from primal cuts was con-

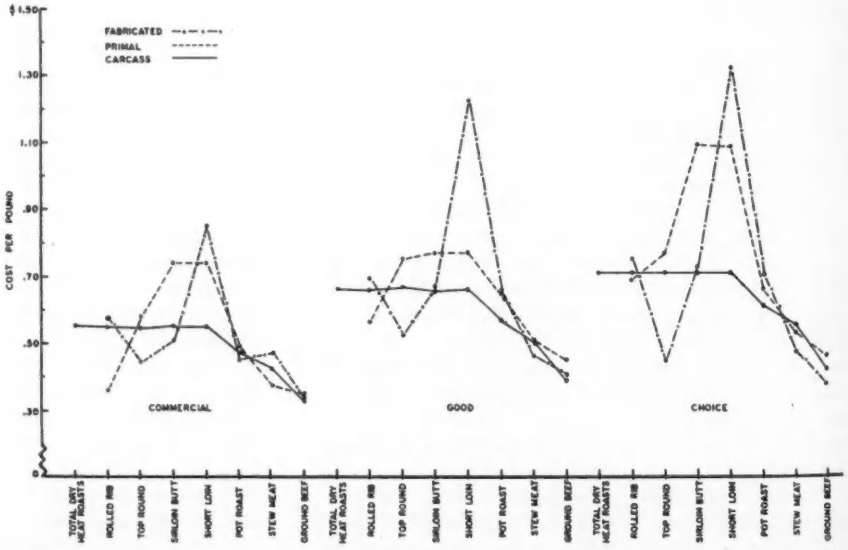

Fig. 1. Effect of grade on cost of boneless beef

TABLE 6

Raw food cost for designated portions of beef items

ITEM	SIZE OF PORTION (raw weight)	COST PER SERVING								
		Commercial grade			Good grade			Choice grade		
		Boneless, oven-ready with labor		Fabricated	Boneless, oven-ready with labor		Fabricated	Boneless, oven-ready with labor		Fabricated
		Carcass	Primal cut		Carcass	Primal cut		Carcass	Primal cut	
	oz.									
Dry-heat roasts										
All types	5	$.18	$ —	$ —	$.21	$ —	$ —	$.23	$ —	$ —
Rib rolled	6	.22	.14	.22	.26	.22	.26	.28	.27	.28
Top round	4½	.16	.16	.12	.19	.21	.15	.20	.22	.13
Sirloin butt	4½	.16	.21	.14	.19	.22	.19	.20	.31	.21
Strip loin	6	.22	.28	.32	.25	.29	.46	.28	.41	.49
Pot roast	4½	.14	.14	.13	.16	.18	.18	.18	.19	.20
Stew meat	4	.11	.10	.12	.13	.13	.12	.14	.14	.12
Ground beef	4	.08	.09	.08	.10	.11	.10	.11	.12	.09

sistently lowest in cost among the methods of purchase for each of the three grades. Not only was rolled rib from primal cuts less expensive than from other sources in each grade, but this item from primal cuts of Commerical grade was lower in cost per pound than all other dry-heat roasts of the three grades. This item was also less expensive than all of the less tender classifications except Commercial grade of ground beef from carcass, primal cut, and fabricated sources.

Top round was least expensive in each grade when purchased in fabricated form, as shown in Figure 1. An unusual market condition resulted in a lower, but misleading cost per pound for Choice grade fabricated top round. According to the market prices at the time of this study, the cost of Choice grade top round, purchased in fabricated form, appeared to be considerably less than this item in Good grade and the same as Commercial grade. Fabricated top round of Choice grade was also less expensive than the top rounds prepared from carcass or primal-cut rounds in all grades.

Sirloin butt in the Commercial grade was least expensive when purchased in fabricated form; in Good and Choice grades, sirloin butt cost slightly less per pound when prepared from carcass sources than when procured by the other two methods. Choice grade sirloin butt from the carcass source was even less expensive than sirloin butt of Commercial grade from primal cuts. Choice grade of strip loin from carcass was less expensive than Commercial grade which had been prepared from primal cuts or purchased in fabricated form. Commercial grade strip loin from carcass, costing 55.09 cents per pound, was less expensive than the pot roasts from all sources of purchase in Good and Choice grades.

Fabricated ground beef of Choice grade could be purchased for less than Good grade ground beef obtained by any of the three methods of purchase. It was only 4.78 cents higher per pound than the least expensive ground beef in the Commerical grade.

PORTION COSTS

To evaluate and control his financial position, a food service manager must know the portion costs of the food items. Because meat is consistently the most costly of his purchases, it is the most important item to be studied.

The size of the uncooked portions used for comparison of costs in this study was arbitrarily selected. The top round, sirloin butt, and bottom round were planned to be 4½-oz. portions. The rolled rib and strip loin portions were considered as 6-oz. portions, and 4 oz. raw weight was planned for the stew meat and ground beef portions (Table 6).

The calculated costs per portion were compared among grades and methods of purchase. Sirloin butt prepared from Commercial grade beef varied from 14 to 21 cents per portion. The fabricated source was the least expensive, and the primal cut the most expensive. The variations in portion costs of Good grade sirloin butt were not as great. Sirloin butt from carcass beef cost 19 cents per portion, which was 3 cents less than from the primal cut and practically the same as the fabricated sirloin butt roast. Much greater variation appeared in the Choice grade roasts. Sirloin butt from carcass and fabricated sources cost approximately 20½ cents, but the portion from primal cut source cost 31 cents, a difference of 10½ cents per portion.

The variations in costs per portion of the less tender cuts were less marked among the three methods of procurement in each grade than the differences among the dry-heat roasts. A portion of pot roast prepared from Commercial grade fabricated round was the least expensive in that grade. In Good grade, the costs per serving of pot roast from primal cut and from fabricated sources were almost identical and exceeded the cost from the carcass by approximately 2 cents per portion. Again, in Choice grade, the carcass source of pot roast was less expensive than the primal-cut and fabricated sources.

Stew meat prepared from primal cut chucks, at 10 cents, was 1 cent less than the portion costs of the carcass stew meat and 2 cents less than fabricated stew meat of Commercial grade. In Good and Choice grades, the fabricated stew meat was the least expensive source among the methods of purchase. The fabricated stew meat of Choice grade was equal to or less in cost per portion than Commercial and Good grade, except for the primal-cut source in Commercial grade.

In both Commercial and Good grades of ground beef, the portion cost from primal-cut sources exceeded the carcass and fabricated sources by 1 cent. The Choice grade of fabricated ground beef could be bought at a cost of 3 cents less per portion than ground beef from the primal-cut rounds.

RELATIONSHIP OF PORTION COSTS TO PURCHASE PRICES

Among the three grades and three methods of purchase of rolled rib, the raw weight cost ranged from 14 to 28 cents per portion. The price per pound of this same beef ranged from 25 to 74 cents. The portions lowest in cost were not necessarily prepared from beef that was the least expensive to purchase.

A portion of rolled rib costing 14 cents had been procured at 26 cents per pound. Three of the rib portions cost approximately 22 cents each. The Commercial grade carcass had been purchased for 32 cents per pound, the Good grade rib from the primal cut had cost 42 cents, and the Commercial grade fabricated rib had cost 58 cents. Another three of the nine rolled rib portions cost approximately 26 cents per portion. Good grade of carcass beef cost 32 cents per pound, the Good grade fabricated roast cost 69 cents per pound, and the Choice grade primal-cut rib had cost 51 cents per pound. Two of the Choice grade rib portions cost 28 cents each. One had been prepared from carcass sources costing 42 cents per pound, the other from fabricated sources at 75 cents per pound.

The portion costs of pot roast prepared from bottom round varied from 12 to 20 cents. The pot roast which cost 12 cents per portion had been procured as Commercial grade fabricated round bought at 45 cents per pound. Yet, four other portions which cost as much as 6 cents more per portion had been prepared from bottom round which cost less per pound to purchase than the Commercial grade fabricated pot roast. These were the Commercial grade carcass and primal-cut rounds, and Good and Choice grades of carcass rounds. Four of the pot roast portions cost 18 cents each. These were prepared from round purchased at 42 to 65 cents per pound. Another portion costing less than 20 cents had been prepared from a fabricated round of Choice grade selling for 70 cents per pound.

From these examples it can readily be seen that the purchase price per pound is no index to the cost per portion.

LABOR COSTS

The cost of preparing the rolled rib roasts varied from 1.57 to 2.75 cents per pound. The labor costs decreased as the value of the grade increased when the rib roasts were prepared from carcass beef. From primal-cut rib sections, the labor costs increased with the value of the grade. The labor costs of preparing top round varied only 0.09 cents per pound among the grades and methods of purchase, with an average cost of 0.73 cents per pound.

Preparation of the sirloin butt from primal-cut sources cost from one-third to one-half of the labor cost of this oven-ready item prepared from carcass sources. The differences in labor costs of strip loin were found to be less in each grade when the roast was prepared from primal-cut loins than when the roast was prepared from carcass beef. In contrast, the preparation of bottom round and ground beef from primal cuts was more expensive in each grade than the carcass cuts. Labor costs per pound for the preparation of stew meat did not vary consistently with either the grade or the method of purchase.

UTILIZATION OF CARCASS AND PRIMAL CUTS

In choosing the method of purchase, a food service operator is faced with the major consideration of utilizing all items from carcass and primal cuts of beef. In addition to being concerned with the use of all leftover items from a shipment after he has removed the menu item, he must be aware of the total dollar value of these remaining items.

Careful attention must also be given to selecting cooking methods most advantageous to the relative tenderness of the cut. Tender cuts from the loin and rib area of the animal must not be sacrificed for ground beef or stewing meat. Neither should the less tender cuts be prepared by dry-heat cooking methods.

To illustrate this problem of utilization and its financial aspect, an example is cited. A dinner menu, including a roast of Good grade top round, was planned for 1000 men. The raw weight portion size was designated at 4½ oz. To serve this item, 281 lb. boneless uncooked meat were needed. The percentage yield of top round from the carcass weight of the average Good grade carcass was found to be 6.06 per cent. Based on this percentage, a total of 4461 lb. carcass beef was needed to obtain the 281 lb. top round for the dinner.

The following items would remain to be used from the total poundage of carcass meat required to obtain the 281 lb. top round (Table 7): 778 lb. dry-heat roast, including 289 lb. rib, 287 lb. sirloin butt, and 202 lb. strip loin; 429 lb. pot roast; 1275 lb. stew meat; and 629 lb. ground beef. The buyer of this amount of carcass meat would also have 486 lb. excess fat and 763 lb. bone to use or handle as salvage.

TABLE 7

Dollar value of items remaining after removal of 281 lb. top round from 446½ lb. carcass beef (enough top round to serve 1000 men 4½-oz. [raw weight] portions)

ITEM	WEIGHT REMAINING	VALUE
	lb.	
Dry-heat roasts		
Rib	289	$190.77
Sirloin butt	287	189.88
Strip loin	202	133.48
Pot roast	429	244.44
Stew meat	1275	646.17
Ground beef	629	249.34
Total		$1654.08

The value of these cuts (Table 7) was found to be: rib, $190.77; sirloin butt, $189.88; strip loin, $133.48; and pot roast, $244.44. A sum of $646.17 was tied up in the 1275 lb. stew meat, and the ground beef remaining was valued at $249.34. The cost per pound of each of these items was the boneless, oven-ready cost calculated from the yield and the market cost. Because wages of meat cutters are so variable, the labor cost was not included in these values.

Not only must the food service operator plan his menu for immediate and effective utilization of this poundage of meat stored in his refrigerators, but he must consider the $1654.08 at which the meat is valued.

However, to serve just one type of dry-heat roast from a full carcass would be unusual in the operation of most institutional food services except for special occasions. A more reasonable procedure would be to plan to use all of the dry-heat roasts, including rolled rib, top round, sirloin butt, and strip loin for the roast beef dinner. A total of 1373 lb. carcass beef was required to obtain the 313 lb. boneless, uncooked, dry-heat roasts for 1000 portions of roast beef from these combined sources. The average size of the uncooked portions from the total dry-heat roasts was calculated at 5 oz. from the different dry-heat roasts. The following items would be left: 127 lb. pot roast, 377 lb. stew meat, and 186 lb. ground beef. The buyer would also have 144 lb. excess fat and 225 lb. bone to store and utilize or to sell as salvage.

From the total purchase weight of primal cuts required to serve 1000 portions of an oven-ready classification, the buyer would have fewer problems in complete utilization of meat items.

For comparison of the problems of utilizing leftover items from carcass and primal-cut sources, an example of purchasing sirloin butt from the appropriate primal cut of Good grade is shown. The selected primal cut was the full loin which had been trimmed of the flank and cod fat. To obtain the 281 lb. boneless, uncooked sirloin butt required for 1000 portions, 699 lb full loins were needed. Poundage of items remaining to be utilized were: 197 lb. strip loin and 70 lb. ground beef. In addition, there would be 59 lb. fat and 92 lb. bones to be used or to be sold as salvage.

STORAGE SPACE

The average weight of the hindquarters used in this study was 140 lb. The space necessary to hold 1000 lb. chilled hindquarters was 340 cu. ft. For 1000 lb. forequarters, which averaged 146 lb. each, 327 cu. ft. were needed. The primal-cut rounds, chucks, and loins were hung on individual hooks; rib sections were hung on multihook rods. The rounds, which averaged 80 lb. each, required 593 cu. ft. space for 1000 lb. beef. For 1000 lb. rib sections, which averaged 30 lb. each, 265 cu. ft. storage space was necessary. One thousand lb. chucks, weighing 93 lb. each, were held in 513 cu. ft. space. Loins weighing 57 lb. required 842 cu. ft. space for 1000 lb. primal cut.

The chilled storage space was calculated on the basis of the dimensions and layout of a refrigerator in which the system of rails was installed for hanging quarters of beef. To obtain maximum storage of primal cuts, a double-layer or triple-layer system of rails in an equal amount of floor space would be necessary. Storage space required for the same amounts of meat would then be one-half or one-third of the space indicated.

For holding chilled or frozen fabricated beef, considerably less storage space is needed than for storing carcasses and primal cuts. One thousand lb. fabricated beef, in twenty 50-lb. boxes, can be stored in 180 cu. ft. This space included the dunnage on which the boxes of meat are stacked and a 6-in. distance between the wall and the containers.

FURTHER INVESTIGATION

Because this project has so clearly pointed out the unpredictability of foretelling portion costs from purchase prices, further study of the problem is indicated. It is believed that with the use of certain statistical procedures, a scale can be developed which will indicate the range of market prices considered most economical for specific items among the methods of purchase. Such a scale would enable a food service operator to buy to better advantage in the face of fluctuating market prices.

Conclusions

The following conclusions have been made from the findings of this project:

(a) Variations in percentage yield from the three grades studied were not large enough to warrant buying a certain grade of carcass or primal cut to obtain a higher actual yield of any of the oven-ready items designated in this investigation. A slight trend toward higher percentage yields of the tender cuts from Choice and Good grades and higher percentage yields of the less tender cuts from Commercial grades was noted.

(b) From the comparison of costs per pound among the three methods of purchase, it was found that no one method was most advantageous for all beef items. However, the data indicated that certain items might be purchased most advantageously as fabricated cuts, whereas others could be procured and prepared more economically from either carcass or primal cut. Rolled rib roast prepared from the primal-cut rib section was least expensive of the three methods of purchase for each grade.

The quotations for fabricated top round were less in each grade than the cost of preparing top round from carcasses or primal cuts. Short loin was cheapest in each grade when prepared from carcass beef.

(c) A buyer purchasing all fabricated meats has no remaining items which must be used within a short time. However, he may find a greater fluctuation of prices in certain fabricated items because of variation in demand for the items. Because there is a greater year-round demand for fabricated loin roasts and steaks by food service institutions specializing in these items, the buyer of fabricated meats may find that the prices he pays for loin cuts are far more than the prices of similar items prepared from carcass and primal cut sources.

Summary

The method of purchasing beef most suitable for a certain food service operation will depend on a number of factors. The factors which are objective and can be measured by an alert manager are: (a) the financial aspects of complete utilization of carcass and primal cuts of beef, (b) the calculation of portion costs and their relationship to purchase prices, and (c) the labor costs involved in the preparation of carcass and primal cuts by well-trained meat cutters.

Factors other than direct meat and labor costs which can influence the buyer of institution beef are: (a) storage facilities available for carcass and primal cuts, (b) problems in menu planning associated with satisfactory utilization of the entire carcass and primal cuts, and (c) problems of disposal of salvage, such as bones, trim, and excess fat.

Without a thorough study of costs and needs, a food service operator cannot assume that buying carcass beef will result in substantial savings. Careful analysis of all factors involved in purchasing beef is the only sound basis for selecting the best method of procurement for a particular food service operation.

Hints for Salesmen

The July issue Bureau Dietary News *carried the following suggestions for salesmen who wish to sell to dietitians.*

At your initial visit to a hospital, it is advisable to inquire the name and title of the person doing the purchasing. If there is a purchasing agent, be sure to meet him first. Then, if you would like to contact the dietitian, ask the purchasing agent the hospital procedure for seeing her. If the dietitian handles the purchasing, follow the hints listed below.

Remember, dietitians are as anxious to do business with you as you are to do business with the dietitians.

What are the most effective ways for accomplishing this?

Always

1. Walk in the front door of a hospital. Ask at "Information Desk" if it is convenient for the dietitian to see you. If not, make a future appointment.
2. Plan what you have to say about your product in a minimum amount of time.
3. Be on time for your appointment. Notify dietitian if delayed.
4. Tell the truth about your product.
5. Quote prices clearly.
6. Try to understand and meet the hospital's needs.
7. Remember that the dietitian is interested in buying the best product for the least amount of money.
8. Be willing to furnish a sample for the dietitian to compare with a similar product at her convenience in the department.
9. Give the dietitian adequate time for sampling before asking her opinion.
10. Be willing to give credit for unsatisfactory product.

Never

1. Look over stock in refrigerator, storeroom, or elsewhere. (Remember, the stock is privately owned by the hospital.)
2. Inquire about brands used.
3. Ask the names of the hospital's dealers.
4. Quote another dietitian.
5. Quote or show another hospital's order.
6. Discuss another dietitian.
7. Call on a dietitian at meal time.
8. Expect an order the first time you call.
9. Expect to see the dietitian each time you are in the vicinity of the hospital.
10. Offer gifts or gratuities at any time.

Labor in the Dietary Department[1]

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THIS study had two purposes. The first was to make a comparison of several hospitals of similar size and type as to the number of minutes of labor time used per meal served, keeping in mind the relative scope of duties in the respective departments. It was hoped that it might be possible to make this comparison separately for the cafeteria and the tray service, as well as for the department as a whole.

It has been suggested that one way of evaluating the efficiency of labor usage in a dietary department may be to determine the ratio between labor cost and food cost, and further, that these two figures should approach equality. The second purpose of this study was to determine the validity of this concept.

A questionnaire was sent to eighteen general hospitals. These hospitals were thought to range in size from about four hundred to about eight hundred beds. They were all either municipal or university hospitals. The scope of this questionnaire is shown in the tabulation of results.

Thirteen replies, or 72 per cent, were received. It should be noted that the results may be influenced by the fact that university hospitals responded better than municipal hospitals, and those with dietetic internships better than those without. The teaching hospital is apparently the one prepared to deal with questionnaires, or perhaps it has more adequate records from which to compile the information requested. In Table 1 is tabulated a summary of the data concerning the response.

Findings

An analysis of the data is shown in Table 2. The information received was fairly complete except that:

(a) One hospital (No. 12) failed to include cafeteria census and all cost figures. This made it impossible to include this hospital in the averages.

(b) Hospital No. 8 specified that labor used in tray service was not charged on the dietary department payroll. Therefore, it seemed unfair to include this hospital in cost averages, although it is included in computations of labor time.

(c) Only two hospitals (Nos. 1 and 10) were able to supply separate labor and cost figures for cafeteria and service to patients, so that it was necessary to forego the comparison of the relative requirements of these two services.

TABLE 1

Summary of response to questionnaire

TYPE OF HOSPITAL	QUESTIONNAIRES MAILED	REPLIES RECEIVED	PERCENTAGE REPLYING
University hospitals	7	6	86
County and city hospitals	10	6	60
Endowed hospitals	1	1	100
With dietetic internships	11	10	91
Without dietetic internships	7	3	43

Factors Affecting Data

The hospitals chosen for discussion below are the two with the lowest and the two with the highest labor usage.

Hospital No. 7, using the least minutes per meal (12.05) also is somewhat less inclusive in the scope of its dietary department service than most of the others. The nursing department apparently takes an active part in tray service. The dining room is open only limited hours. There are no private patients, and a selective menu is not used.

Hospital No. 4, on the other hand, using the highest number of minutes per meal (22.11), has a high proportion of private patients and uses a selective menu. The dietary department is entirely responsible for patients' food service except that the nursing department delivers trays, and infant formulas are purchased outside the hospital.

Hospital No. 1 seems to be noteworthy because of the fact that it has next to the lowest usage of labor (13.28 min.) and at the same time gives broad coverage. The dietary department has complete responsibility for service to patients, the cafeteria census is large, and cafeteria hours of service are the longest reported.

[1] Received for publication May 24, 1956.

TABLE 2

*Compilation of data from questionnaires**

SUBJECT	HOSPITAL NO. 1	HOSPITAL NO. 2	HOSPITAL NO. 3	HOSPITAL NO. 4	HOSPITAL NO. 5	HOSPITAL NO. 6	HOSPITAL NO. 7	HOSPITAL NO. 8	HOSPITAL NO. 9	HOSPITAL NO. 10	HOSPITAL NO. 11	HOSPITAL NO. 12	HOSPITAL NO. 13
I. General information.													
A. Bed capacity	500	750	395	352	432	526	650	956	540	310	750	429	365
B. Ownership	county	univ.	univ.	univ.	city	univ.	county	city	univ.	univ.	univ.	county	endowed
C. Location	West	Mid-west	West	West	West	Mid-west	Mid-west	Mid-west	Mid-west	West	Mid-west	West	West
D. Total number on payroll, including students	855	—	1,500	650	950	888	—	—	1,578	450	1,000	921	—
E. Per cent total personnel assigned to Dietary Department	12.3	—	5.0	14.1	9.3	8.0	—	—	12.9	13.9	13.4	9.7	—
F. Dietary employees per bed	0.21	0.16	0.19	0.26	0.21	0.13	0.13	0.20	0.38	0.20	0.18	0.21	0.15
II. Scope of service.													
A. To in-patients													
1. Tray service													
a. Number trays per month	31,609	45,759	25,680	21,773	27,553	40,437	45,900	66,762	36,000	27,569	49,414	31,000	23,851
b. Type of service	central conveyor	decentralized	decentralized	decentralized	central truck	decentralized	decentralized	decentralized	decentralized	decentralized	decentralized	central truck	centralized
c. Selective menu?	no	no	part	part	no	no	no	part	yes	no	no	no	yes
d. Proportion of private patients	none	30%	none	66%	none	20%	none	none	42%	none	45%	none	—
e. Department responsible for:													
(1) Making up and changing tray lists	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet., Nrs.	Wd. Sec.	Nrs.	Diet.	Nrs.	Nrs.	Diet.
(2) Making up tray slips for house diet	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet., Nrs.	Diet.	Diet.	Diet.	Nrs.	Nrs.	Diet.
(3) Service of house diets	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet., Nrs.	Diet.	Diet.	Diet.	Diet.	Diet.	—
(4) Writing individually modified diets	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.
(5) Service of modified diets	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	—
(6) Delivery and pick-up of trays	Diet.	Nrs.	Nrs.	Nrs.	Diet., Nrs.	Nrs.	Diet., Nrs.	Nrs.	Diet.	Nrs.	Diet., Nrs.	Nrs.	Diet., Nrs.
2. Between-meal service													
a. To patients	selected	all	selected	all	selected	selected	selected	selected	selected	selected	selected	selected	selected
b. Served by what department?	Diet.	Nrs.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet.	Diet., Nrs.	Nrs.	Diet.
c. Delivered by what department?	Diet.	Diet.	Nrs.	Nrs.	Diet	Diet.	Diet.	Nrs.	Diet.	Diet.	Diet., Nrs.	Diet.	Diet.
3. Infant formulas													
a. Average number per month	590	3,393	750	†	733	2,389	900	2,996	1,500	419‡	‡	1,800	—
b. Department responsible	Diet.	Diet.	Diet.	†	Diet.	Diet	Diet.	Diet.	Diet.	Nrs.	Nrs.	Diet., Nrs.	Nrs.
B. Meal or snack service to out-patients													
1. Number patients served per month	630	200	—	—	350	65	—	§	—	—	—	—	—
2. Number of hours open per week	16	10?	—	—	168	none	—	—	—	—	—	—	—
C. To personnel and guests													
1. Cafeteria service													
a. Is it a pay cafeteria?	yes	part	yes	part	yes	none¶	yes	yes	yes	yes	yes	no	yes
(1) If so, is charge by item or by meal?	item	meal	item	both	item	—	item	meal	item	item	item	—	item
b. Number meals served per month	44,300	31,341	25,000	15,646	18,507	—	26,000	48,724	43,700	13,544	38,271	—	13,885
2. Snack bar or coffee shop													
a. Staffed by Dietary Department personnel?	yes	no	yes	yes	yes	—	no	no	yes	yes	no	no	no
b. Number served per month	4,950	—	no record	6,000	9,800	—	—	—	19,300	5,056	—	—	—
3. Hours of service available in 24 hr.	20½	7½	10¼	12	13	none	5½	7¾	17½	10½	11¾	5	8½
D. Total meals served													
1. Per month	82,079	80,693	51,430	43,419	56,943	42,891	72,800	118,482	100,500	46,588	87,685	—	37,736
2. Per week	18,941	18,621	11,868	19,020	13,141	9,898	16,800	27,342	23,192	10,751	20,235		8,709

TABLE 2—*Continued*

SUBJECT	HOSPITAL NO. 1	HOSPITAL NO. 2	HOSPITAL NO. 3	HOSPITAL NO. 4	HOSPITAL NO. 5	HOSPITAL NO. 6	HOSPITAL NO. 7	HOSPITAL NO. 8	HOSPITAL NO. 9	HOSPITAL NO. 10	HOSPITAL NO. 11	HOSPITAL NO. 12	HOSPITAL NO. 13
III. Personnel.													
A. Dietitians													
1. Number	2	3	2	1	2	2	2	3	3	1	3	2	1
2. Qualifications	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.
3. Salary	$2,400	$3,000	$2,400	$2,400	$2,400	$2,400	$2,400	$3,000	$3,000	$2,400	$3,000	$2,400	$2,400
B. Assistant dietitians													
1. Number	1	1	1	1	1	1	1	1	1	1	1	1	1
2. Qualifications	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.	R.D.
3. Salary	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400
C. Dietetic interns													
1. Number	1	1	1	1	1	1	1	1	1	1	1	1	1
2. Salary	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200
D. Supervisors													
1. Number	1	1	1	1	1	1	1	1	1	1	1	1	1
2. Salary	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800
E. Cooks													
1. Number	3	3	3	3	3	3	3	3	3	3	3	3	3
2. Salary	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800
F. Other employees													
1. Number	24	24	15	10	18	15	20	30	30	12	24	15	12
2. Salary	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200
IV. Budget.													
A. Per cent total budget assigned to Dietary Department	12.3	—	5.0	14.1	9.3	8.0	—	—	12.9	13.9	13.4	9.7	—
B. Per cent Dietary Department budget assigned to food	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
C. Per cent Dietary Department budget assigned to labor	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
D. Per cent Dietary Department budget assigned to other expenses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E. Per diem cost per patient	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00

* Data from questionnaires returned by 13 hospitals.

† Infant formulas prepared in Pediatrics Department.

‡ Infant formulas prepared in Central Supply Department.

§ Snack bar operated by Nurses' Association.

¶ Cafeteria operated by Nurses' Association.

SUBJECT	HOSPITAL NO. 1	HOSPITAL NO. 2	HOSPITAL NO. 3	HOSPITAL NO. 4	HOSPITAL NO. 5	HOSPITAL NO. 6	HOSPITAL NO. 7	HOSPITAL NO. 8	HOSPITAL NO. 9	HOSPITAL NO. 10	HOSPITAL NO. 11	HOSPITAL NO. 12	HOSPITAL NO. 13
3. Hours of service available in 24 hr.	20½	7½	10¼	12	13	none	5½	7¾	17½	10½	11¾	5	8½
D. Total meals served													
1. Per month	82,079	80,693	51,430	43,419	56,943	42,891	72,800	118,482	100,500	46,588	87,685	—	37,736
2. Per week	18,941	18,621	11,868	10,020	13,141	9,898	16,800	27,342	23,192	10,754	20,235	—	8,709

TABLE 2—*Continued*

SUBJECT	HOSPITAL NO. 1	HOSPITAL NO. 2	HOSPITAL NO. 3	HOSPITAL NO. 4	HOSPITAL NO. 5	HOSPITAL NO. 6	HOSPITAL NO. 7	HOSPITAL NO. 8	HOSPITAL NO. 9	HOSPITAL NO. 10	HOSPITAL NO. 11	HOSPITAL NO. 12	HOSPITAL NO. 13
E. Special services													
1. Special functions and meetings using reserved dining rooms (number per month)	90–100 cigarettes	50	10–20	70+ cigarettes;	20–30 cigarettes;	none	5–7 cigarettes	40–50	25	60 cigarettes;	30–40 cigarettes;	50‖ cigarettes;	3–4
2. Dispensing machines		coffee; soft drinks; pie; candy; juice; milk§	§	soft drinks; candy	soft drinks; candy; gum	—		—	—	soft drinks; candy	coffee; soft drinks; candy; tea	coffee; candy; ice cream; soft drinks; milk§	—
F. Advisory service to out-patients through a food clinic	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
1. Number of patients seen per month	525	150	210	450	125	588	650	—	400–500	400	169	300	—
2. Number hours per week service is available	40	40	40	40	40	40	40	—	40	40	45	40	—
G. General administration—department responsible for:													
1. Purchasing	Pur.	Pur.	Pur., Diet.	Pur., Diet.	Commissary	Pur.	Pur.	Pur.	Pur., Diet.	Pur.	Pur.	Pur.	Pur., Diet.
2. Storage	Bus.	Supply	Diet.	Store	Diet.	Bus., Diet.	Diet.	Bus.	Pur., Diet.	Diet.	Diet.	Bus.	Diet., Pur.
3. Food cost accounting and records	Diet.	Diet.	Diet.	Bus.	Diet.	Diet.	Diet.	Diet., Bus.	Pur., Diet.	Diet.	Diet.	Diet.	Diet., Bus.
4. Payment of bills	Bus.	Bus.	Bus.	Pur.	Bus.	Bus.	Bus.	Bus.	Bus.	Bus.	Bus.	Bus.	Bus.
5. Payroll	Diet.	Diet.	Diet.	Bus.	Diet.	Diet.	Payroll	Diet., Bus.	Payroll	Diet.	Diet.	Diet., Bus.	Diet., Bus.
III. Labor policies													
A. Schedule													
1. Hours in working week	40	40	40	40	40	40	40	40	40	40	40	40	44
2. Proportion of employees working split shift	none	none	none	none	none	0.085	none	0.470	none	none	0.500	none	none
3. Hours of coverage by dietitians	6 a.m.–8 p.m.	8 a.m.–6:30 p.m.	7 a.m.–6:30 p.m.	6 a.m.–6:30 p.m.	6:30 a.m.–6:30 p.m.	6:30 a.m.–6 p.m.	6 a.m.–7 p.m.	6 a.m.–8 p.m.	7 a.m.–6:30 p.m.	6 a.m.–6:30 p.m.	6 a.m.–7:45 p.m.	6:30 a.m.–3:30 p.m.	7 a.m.–7 p.m.
4. Hours of coverage by employees	6 a.m.–5 a.m.	6 a.m.–7:30 p.m.	24 hr.	5 a.m.–8 p.m.	5 a.m.–1 a.m.	5:15 a.m.–7 p.m.	6 a.m.–12 MM	4:30 a.m.–1 a.m.	4 a.m.–2:30 a.m.	6 a.m.–12:30 a.m.	5 a.m.–7:45 p.m.	24 hr.	5:45 a.m.–11:30 p.m.
B. Minimum wages per month	$190	$175	$137	$210	$171	$130	$244	$150	$143	$173	$181	$216	$135
C. Are meals part of Dietary Department employees' compensation?	no	no	no	yes, on duty	no	no	no	no	no	no	no	yes	no
IV. Labor time in Dietary Department													
A. Total hours per week													
1. Dietitians	500	480	320	360	320	280	360	560	640	244	320	320	198
2. Dietetic interns	200	400	240	360	—	320	200	—	200	132	160	280	—
3. Food service supervisors	—	80	—	—	320	320	—	400	440	186	—	—	36
4. Secretarial and clerical	60	40	200	40	120	80	40	160	760	—	40	80	70
5. Production	728	800	656	320	560	480	576	1,480	2,080	600	1,494	480	1,540
6. Making up and changing tray lists	44	50	—	—	—	—	—	—	—	—	—	—	44
7. Service	1,785	2,480	1,220	1,880	1,874	1,200	412	3,760	1,320	941	2,168	184	453
8. Delivery and pick-up of trays	425	—	—	—	—	—	688	—	1,160	—	incl.	224	56
9. Bussing and dishwashing for dining rooms	420	480	320	520	280	—	468	1,000	520	100	981	168	—
10. Clean up	incl.	incl.	—	—	incl.	—	568	440	400	200	incl.	961	—
11. Formula preparation	49	60	52	—	80	160	56	160	120	—	—	63	—
12. Other	—	—	—	200	—	—	—	—	520	100	—	200	—
13. Total	4,211	4,870	3,008	3,680	3,554	2,840	3,368	7,564	8,160	2,499	5,375	3,560	2,397
B. Minutes per meal served													
1. Dietitians	1.59	1.55	1.62	2.16	1.46	1.70	1.29	1.23	1.66	1.34	0.95	**	1.36
2. Dietetic interns	0.63	1.29	1.21	2.16	—	1.95	0.71	—	0.52	0.74	0.47	—	—
3. Food service supervisors	—	0.25	—	—	1.46	1.95	—	0.88	1.14	1.04	—	—	0.25

TABLE 2—*Concluded*

SUBJECT	HOSPITAL NO. 1	HOSPITAL NO. 2	HOSPITAL NO. 3	HOSPITAL NO. 4	HOSPITAL NO. 5	HOSPITAL NO. 6	HOSPITAL NO. 7	HOSPITAL NO. 8	HOSPITAL NO. 9	HOSPITAL NO. 10	HOSPITAL NO. 11	HOSPITAL NO. 12	HOSPITAL NO. 13
4. Secretarial and clerical	0.19	0.12	1.01	0.24	0.55	0.48	0.14	0.35	1.97	—	0.11	—	0.48
5. Production	2.24	2.59	3.33	1.92	2.57	2.92	2.06	3.26	5.41	3.36	4.45	—	10.58
6. Making up and changing tray lists	0.14	0.16	—	—	incl.	—	—	—	—	—	—	—	0.30
7. Service	5.68	8.03	6.19	11.13	8.60	7.31	1.47	8.29	3.43	5.28	6.46	—	3.11
8. Delivery and pick-up of trays	1.35	—	—	—	—	—	2.47	—	3.01	—	—	—	0.39
9. Bussing and dishwashing for dining rooms	1.33	1.55	1.62	3.12	1.28	—	1.68	2.20	1.35	0.56	1.33	—	incl.
10. Clean up	incl.	incl.	incl.	incl.	incl.	—	2.03	0.97	1.04	1.12	—	—	incl.
11. Formula preparation	0.15	0.19	0.26	—	0.36	0.97	0.20	0.35	0.31	—	—	—	—
12. Other	—	—	—	1.20	—	—	—	—	1.34	0.56	2.92	—	—
13. Totals													
a. Supervisory and clerical††	2.41	3.21	3.84	4.56	3.47	6.08	2.14	2.46	5.29	3.12	1.53	—	2.09
b. Operational††	10.87	12.52	11.40	17.55	12.81	11.21	9.91	15.07	15.90	10.88	13.83	—	14.38
c. Minutes per meal served††	13.28	15.73	15.24	22.11	16.28	17.29	12.05	17.53	21.19	14.00	15.36	—	16.47
d. Per cent of median													
(1) Supervisory and clerical	77	98	121	144	110	191	67	74	167	98	48	—	66
(2) Operational	85	99	90	138	101	88	78	119	125	86	109	—	113
(3) Total	83	99	95	138	101	108	75	110	132	87	96	—	103
V. Cost													
A. Payroll per meal, including supervision	$0.304	$0.377	$0.326	$0.432	$0.329	$0.379	$0.302	—	$0.328	$0.319	$0.321	—	$0.225
B. Raw food per meal, including supervision	$0.191	$0.319	$0.265	$0.333	$0.239	$0.327	$0.230	$0.353	$0.238	$0.257	$0.238	—	$0.277
C. Payroll: raw food cost (ratio)	1.597	1.181	1.230	1.297	1.376	1.128	1.313	—	1.378	1.241	1.348	—	0.812
D. Payroll, adjusted for wages and hours	$0.275	$0.373	$0.383	$0.357	$0.332	$0.505	$0.214	—	$0.400	$0.319	$0.309	—	$0.321
E. Adjusted ratio	1.439	1.169	1.445	1.072	1.389	1.554	1.074	—	1.680	1.241	1.298	—	1.158

* Abbreviations:
Diet.—Dietary Department
Nrs.—Nursing Department.
Bus.—Business or Accounting Office
Pur.—Purchasing Office
Store—General Stores
Wd. Sec.—Ward Secretary
Incl.—Included in other classifications
† Purchased from a commercial laboratory.

‡ Omitted from calculation of total meal count.
# Milk, fruit, and crackers are sent.
¶ Personnel served in nearby university facilities.
‖ 1½ waitresses assigned.
§ Not by Dietary Department.
** Figures not meaningful because no cafeteria census available.
†† *Averages*

	Mean	*Median*
Supervision	3.35 min.	3.17 min.
Operation	13.03 min.	12.67 min.
Total	16.38 min.	16.00 min.

Hospital No. 9 is next to the highest in its usage of labor (21.19 min.). It should be noted, however, that this department provides a great deal of service. The dietary department is almost completely responsible for food service to patients. It is the only hospital in the series having a selective menu throughout. It has many private patients. The cafeteria has a high census and is open long hours.

Hospitals Nos. 1 and 9 are the only ones in this study which have been seen by either of the authors. No. 9 is a building with a difficult transportation problem, since the trays must be sent long distances on the horizontal. No. 1 is a tall building with the kitchen centrally located and has an ideal situation for centralized tray service. While there are many factors to account for the differing labor needs of these two hospitals, architecture has an obvious influence. If the other eleven hospitals were similarly observed, no doubt this factor would appear frequently.

Both supervisory and operational labor figures show a wide range. The reasons for some of the deviations from average are obvious. For instance, Hospital No. 6 feeds only patients and can therefore be expected to need a larger proportion of dietitians.

In analyzing these figures, the median was accepted as the accurate average, in order to eliminate the variations in the mean brought about by one or two extreme cases. The median and the mean, however, are similar and show slightly more than 3 min. supervisory and clerical time and about 13 min. operational time per meal served.

A comparison has been made with the man-hour requirements reported by May (1). Realizing that his study was done in hospitals of 170 to 270 beds and that the results can, therefore, not be expected to be identical with those from much larger hospitals, the comparative figures in Table 3 may nevertheless be of interest.

TABLE 3

Man-hour requirements reported in this study and in May's study (1)

TYPE OF LABOR	THIS STUDY		MAY STUDY (1)	
	Range	Median	Range	Median
	min./meal	*min./meal*	*min./meal*	*min./meal*
Dietitian	0.95–2.16	1.50	0.24–1.33	0.53
Total for dietary department	12.05–22.11	16.00	10.60–27.00	20.10

Value of Labor:Raw Food Ratio

The second part of this study is the evaluation of the validity of using the ratio of labor cost to raw food cost in measuring dietary department efficiency. Obviously, this is simply another way of expressing the common measurement in terms of percentage of total cost spent for labor, food, and overhead, except that no attempt was made here to determine overhead. Obviously, too, this is subject to the influence of a number of variables.

First, there may be a difference in working hours. This did not prove to be important, since the 40-hr. week and the straight shift seem to have become almost universal. A 44-hr. week is reported by Hospital No. 13. Hospitals Nos. 8 and 11 were the only ones reporting a significant number of split shifts. In the final computation of ratio (Table 2, last line) the ratio for hospital No. 13 has been recalculated to adjust for the deviation in the working week.

Second, and perhaps most important, is the diversity of salary scales. In order to estimate relative salaries, the questionnaire asked for the minimum wage. This does not take into account the proportion of personnel receiving higher rates. It seemed unreasonable, however, to expect the contributors to give more detailed information, and improbable that such comparisons could be adequately evaluated. Realizing this limitation of method, per capita labor costs have nevertheless been recalculated to the median wage of $173 per month to give a reasonable basis for making a comparison.

The other major variable is the food cost. There is some justification for assuming that labor cost and food cost should vary proportionally, and the ratio could, therefore, be standardized. Elaborate food, with a high food cost, may be expected to take more time for preparation and service. An attempt was made to compare menus, but only five sets were received. Of these, the one from Hospital No. 1 was much simpler than those from Nos. 5, 6, 8, and 11.

With the labor cost adjusted as described above, the ratio between labor cost and food cost ranges from 1.1 to 1.7, with a median of 1.3.

Hospitals No. 7 and 4 were the lowest, as was No. 7 in number of minutes per meal served. Hospital No. 7 seems to need no further explanation. For No. 4, the low ratio was related to a high raw food cost.

Hospital No. 9, which was next to the highest in its use of labor, is the highest in its ratio of labor cost to food cost. This may be due in part to a relatively large use of supervisory and clerical personnel, but the fact that its per capita food cost is near the lower end of the range is probably the most significant reason for the high ratio.

Hospital No. 6, which is next to the highest in ratio, should probably be omitted from consideration, since it is atypical. This hospital serves only patients, and tray service may reasonably be expected to require more professional supervision and more labor than cafeteria service.

Hospitals No. 1 and 3, then, share the next-to-highest position. In the case of No. 1, this is due to the extremely low raw food cost. In common with No. 9, the cafeteria census is higher than the tray count, and cafeteria serving hours are long. Both are pay cafeterias which sell by the item. This undoubtedly means that some of the cafeteria meals reported in the census are not complete meals.

An evaluation of data on No. 3 seems to offer no suggestions as to the reason for its position in the range of ratios.

Summary and Conclusions

A questionnaire was sent to eighteen hospitals to obtain a picture of labor requirements of hospital food service departments in relation to scope of service. Thirteen replies were received. An analysis of data is presented.

The dietary departments studied average slightly more than 3 min. supervisory and clerical time and approximately 13 min. of other labor per meal served. This method of comparing the efficiency of dietary departments would seem to be of value. It should not be applied arbitrarily, however, because it takes account neither of the scope of the work done by the department nor of the architectural factors involved.

The use of the ratio of labor cost to food cost appears to be valid as a method of comparison, only if careful evaluation and proper interpretation is made of the variables which affect this ratio.

REFERENCE

(1) May, E. N.: Economics of hospital food service. Special Report. Modern Hosp. 85: insert (Oct.), 1955.

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Chocolate Milk Service in Schools

In South Dakota, the introduction of daily chocolate milk service in nine schools was credited with increasing total milk consumption during a six-week experiment. The study, supported by the U.S. Department of Agriculture under the Special School Milk Program, was conducted under the auspices of the South Dakota Department of Public Instruction. Merle Hagerty, Director of School Lunch Division, was directly in charge of the study.

During the first four weeks of the experiment, both plain and flavored milk was available to students, while in the last two weeks, chocolate milk was discontinued and only plain milk was served. Average daily milk consumption was compared with that during a pre-experimental month.

The introduction of chocolate milk was credited with increasing milk consumption for the first two weeks by 9 to 10 per cent over the pre-experimental month. This gain fell to 5 per cent in the succeeding two weeks. In the last two weeks of the experiment, when chocolate milk was withdrawn, total milk consumption declined to 78 and 73 per cent respectively, of the pre-experimental month. This last drop was felt to be due to unseasonably warm weather, during which fewer children ate at school and more went home for lunch. The decline from the first to the fourth weeks of the experiment from 4098 to 3654 half-pints of chocolate milk (11 per cent) was felt to reflect the wearing off of the novelty effect of the chocolate milk service.

In analyzing the data, the researchers point out that in addition to the service or non-service of chocolate milk, such extraneous factors as weather, prices, time of service, and temperature of milk also affect consumption considerably.

In a questionnaire survey of the milk-serving practices in schools, replies from 72 administrators representing approximately 10,000 students indicated that 66 per cent of the pupils drank chocolate milk while only 20 per cent drank plain milk and 14 per cent drank no milk at school. Of the 198 schools replying to this survey, 98 did not serve chocolate milk for various reasons; 54 served it every day, while frequency of service in the remainder varied from an occasional service to four times a week. In thirty-seven schools which did not serve it daily, it was reported that more milk was drunk on days when chocolate milk was offered. Seven schools reported that total milk consumption did not increase on such days.

Nearly two-thirds of the schools serving chocolate milk reported that it cost no more than plain milk, but for the rest, it cost from ¼ cent to 2 cents more per half pint. However, of 100 schools serving both plain and chocolate milk, only five charged students a higher price for the flavored milk.

A second questionnaire was sent to the students in the nine experimental schools in an effort to learn their reactions to milk service at school. Replies from 3600 indicated that 98 per cent liked milk served at school, and 91 per cent liked chocolate milk compared with only 75 per cent stating a liking for plain milk. Seventy-five per cent of the students wanted more milk served at school, and 81 per cent wanted more chocolate milk, which was preferred by 78 per cent of the students, compared with 22 per cent who liked plain milk better. Cool milk was preferred over cold milk by 97 per cent, while 3 per cent liked warm milk.

Fifty-seven per cent of these students favored milk service before the start of class in the morning, and 79 per cent felt that mid-morning milk service was desirable; 81 per cent indicated a desire for a mid-afternoon milk break as well. The use of a straw for drinking milk was preferred by 57 per cent, while 32 per cent preferred drinking milk from a glass, and 11 per cent liked drinking it directly from the bottle or carton.

Current Comment

Training of Food Service Supervisors—Michigan State University

MARGARET GILLAM

Course Coordinator, Food Service Supervisors' Course, Michigan State University, East Lansing

The Food Service Supervisor's Course for hospital personnel inaugurated this year at Michigan State University is a pilot project that could have much significance throughout the nation.

About two years ago, the Professional Services Committee of the Michigan Hospital Association approached the Executive Board of the Michigan Dietetic Association to discuss what might be done to relieve the shortage of dietitians in Michigan. After discussion, a training course for food service supervisors was proposed: (a) to satisfy the need of the small hospital unable to command the services of a dietitian and (b) to assist the hospital with an organized dietary service but with inadequate numbers of professional dietitians. The two organizations requested the cooperation of the Continuing Education Services of Michigan State University, and a plan of training was drawn up and approved by the three agencies involved.

The implementation of the program at the University was assigned to the Foods and Nutrition Department with coordination of the Continuing Education Services. The extensive staff facilities of the University in these and other departments were made available for teaching units of a varied curriculum designed to improve the competency of trainees in essential managerial skills and in the production and service of food.

Applicants for the course must be currently employed in a hospital and recommended by the administrator as having the ability to benefit by the course of instruction. The applicant should be in a supervisory position or have the potentiality for assuming supervisory duties in the food service department. The tuition charge for the ten-week course is $100. Expenses of students while in training and policies relative to continuing payment of salaries are handled as individual decisions between hospital and enrollee.

Recruiting Students

Recruitment of applicants through a well planned publicity program was the concerted group effort of several organizations. The Michigan Hospital Association printed all material and sent three mailings of information to member hospitals. The program was explained at the annual meeting of the Michigan Hospital Association and at the Area Hospital Council Meetings. One issue of the hospital news letter was devoted exclusively to publicizing the importance of the program to hospital administrators. The Michigan Dietetic Association mailed a copy of this information to its members. The consultant dietitian with the State Department of Health gave coverage of the course in her monthly news letter which reached hospital personnel not covered by the above associations. At the suggestion of the State Health Commissioner, individual letters with information about the course were sent to medical superintendents of state mental hospitals and state tuberculosis sanatoriums.

After applications were received from prospective students, the course coordinator visited each hospital to interview and observe the applicant in his or her work situation. This interview served to give information, to obtain information, and to establish a friendly relationship between the student and the University. These contacts proved invaluable in relating the material presented in the course to the student's work situation. For the student, it relieved his concern about coming to a University, and the interview had much to do with his subsequent attitude toward accepting the responsibility of enrolling in the course. The administrator was reassured in his selection of the trainee. Where there was concern about the trainee's adjustment to kitchen personnel on returning to the hospital, it was explained that the course content was planned to aid the student in practicing good personnel relations with co-workers or when assuming a supervisory position.

Curriculum of the Course

Twenty-five students enrolled for the training course, the first nine weeks of which were given March 3 to May 4. The majority came from hospitals with less than 100 beds, and four of the state mental hospitals enrolled their food managers or stewards.

This first part of the program provided intensive training in food preparation and service and related managerial skills through lectures, demonstration, and laboratory practice periods. The faculty, familiar with and experienced in adult education methods, adapted curriculum material to the particular needs of hospital personnel in food supervisory positions.

Classes were held at Kellogg Center for Con-

tinuing Education. The food laboratories and demonstration rooms in the Home Economics Building were used for teaching the basic principles and practicums in food production. Demonstrations in the use and care of food service equipment were given in the College Residence Halls. Students attended classes 7 to 8 hr. a day. The class hours assigned to each subject were:

Orientation and Ethics	7 hr.
Basic Principles and Practicums in Food Production	84 hr.
Communication Skills	27 hr.
Safety	4 hr.
Food Purchasing	54 hr.
Sanitation	9 hr.
Nutrition	27 hr.
Personnel Management	6 hr.
Supervisory and Job Training Techniques	6 hr.
Records and Cost Accounting	6 hr.
Food Service Administration	27 hr.

"Food Service Administration" included lectures and practice periods. The subjects covered were: fundamentals of supervision, kitchen layout and equipment, use and operation of mechanical equipment, cleaning and maintenance of equipment and facilities, time- and labor-saving smaller equipment, menu planning and precost control, essential information in standardizing recipes and adjusting recipes for yields, standard size portions and portion control, planning and controlling food production, food service to personnel including non-pay and pay service, and food service to patients.

The subjects presented were reviewed and summed up each week in a group evaluation seminar, and additional time was scheduled for personal consultations with the coordinator. Trips were made to small and large hospitals, a large produce terminal, commercial restaurants serving quality food and the State Agricultural Laboratories. Special lectures given at the National Restaurant Short Course and Tourist and Resort Institute were made available to the students. Throughout the course, resource material was given to the students and films were shown that might be used as training aids in their hospitals.

An appreciative and enthusiastic group of students contributed to the success of the course, and faculty members reported that participation in the program was a satisfying and worthwhile experience. Although many specialists assisted with the instruction, the subjects were well integrated and planned in a sequence to lead up to their application in a supervisory position.

Following the first nine weeks of instruction on the campus, the students' administrators and supervisors were invited to Kellogg Center for an afternoon discussion of the course. Over half of the hospitals were represented at the meeting, and a number of others visited the course during its actual operation

Follow-Up Help by Course Coordinator

An important part of the program has been the consultant supervision during the six months following the nine weeks' formal training. This has been a carefully planned, on-the-job follow-up by the course coordinator to review with each trainee the application of the material learned during the course and to give such help and advice as seemed desirable to allow the student to make the greatest use of his training. A greater length of time has been spent in the smaller hospitals in which the enrollee has been promoted from cook to food service supervisor and is assuming the responsibility of managing the dietary department. A project with the Michigan Dietetic Association is to have a dietitian in the area available whom the supervisor may contact, at least by telephone, when problems arise, particularly in the planning of modified diets.

After the six months' on-the-job experience, the trainees will return to the University for a tenth week of review and evaluation of their educational experience and for additional instruction applicable to their needs. At this time certificates will be presented to the graduates.

Students' Accomplishments

It has been gratifying to observe such accomplishments of the students as job schedules, card file of employment records, advance planning of weekly menus, use of rotating menus, improved food purchasing and receiving procedures, perpetual inventory records to save time in preparing purchase orders, and training of workers in sanitation, safety, and the care of facilities.

The administrator in one small hospital reported an improvement in menus, kitchen organization, and quality of food served, and this had been accomplished without upsetting present kitchen personnel. In another hospital, the dietitian has promoted the trainee to a supervisory position and delegated to her definite responsibilities, such as food purchasing and receiving, assisting with menu planning, supervising, food preparation, standardizing recipes, and writing modified diets when the dietitian is off duty. This dietitian states she now has time to visit patients, to give adequate dietary instruction to patients ready to be discharged, to confer with doctors, and to devote time to planning and directing the work in the department. The hospitals that have realized the greatest benefit from the training program have placed the trainee in a position which provides an opportunity for that student to use the knowledge gained in the course.

In hospitals that had no supervisor of the department, the trainee has been promoted from the position of cook to supervisor and in most instances has been given the authority that goes with the position. Several hospitals have expressed interest in sending another employee to the course next year.

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Financial support for the program was obtained from the Kellogg Foundation to be used over a period of three years. Assistance was also received from both the Michigan Hospital Association and the Michigan Dietetic Association, the latter contributing $1000.

This year the course was limited to applicants from hospitals in Michigan. Next year the course will be available on a regional basis which includes the adjoining states of Ohio, Illinois, and Indiana. Enrollment will be limited to forty students.

The Dietary Assistants' Course—Cleveland

ELIZABETH PERRY

Assistant Superintendent and Director, Department of Dietetics, Cleveland City Hospital

With the ever-increasing expansion of hospital facilities and the recognition of the importance of the dietary service to the patient and of its financial responsibility as it relates to and affects the hospital's operating budget, a *new* approach is needed to meet the requirements of dietary service.

The Dietary Assistants' Course, as it operates in Cleveland, *is* a new approach, and it is our belief that Dietary Assistants should have a place in the permanent organization of *all* dietary departments.

The Dietary Assistants' Course, established in Cleveland in 1952 under the co-sponsorship of the Cleveland Board of Education and the Cleveland Hospital Council, was designed to meet the challenge of increased responsibility of the dietary department without increasing the professional staff. Young women trained to be capable supervisors would free the dietitian from time-consuming routine supervisory duties and give her an opportunity to use the skills of her education for better direction of the over-all program of the dietary department.

The Dietary Assistant is trained to work under the direction of the dietitian. *She does not replace the dietitian;* she *assists* her in administrative routines, is responsible to her for the supervision of a given number of employees, and functions as an auxiliary person to the dietitian to whom supervisory duties can safely be delegated.

The position of the Dietary Assistant in the organization was carefully defined to assure respect from other employees and to assure the students that their positions would be permanent in the administrative organization of the hospital. A salary commensurate with their training was established.

The purpose of the course, as defined in the course outline, is to train qualified young women to perform delegated supervisory duties. The program was planned to include a course of study which would give the necessary background for an understanding of the job. The training was adapted to meet the educational background of the students, the majority of whom are high school graduates.

In length, the course is one year, with four months (one semester) of work in theory given at the Jane Addams Vocational High School and eight months in a hospital which has been approved for practical training. Thus, the class work is fairly simple, with considerable emphasis on the training on the job.

Establishing the Course

When the Dietary Assistants' Course was first established in 1952, the procedure followed was:

(a) The purpose of the course was defined.

(b) Community support was solicited and gained.

(c) Management policies for administration were adopted, including the appointment of the Advisory Committee, composed of: the directors of the dietary departments of the hospitals which provide practical experience—Helen Mallory, University Hospital; Florence Levy, Mount Sinai Hospital; and Elizabeth Perry, City Hospital; Grace Martin, Principal, Jane Addams Vocational High School; and representatives from the Hospital Council.

The course requirements for class room work were established, and the practical experience to be gained in the hospital was also outlined. Other decisions concerned:

(a) Financial responsibility of the school, hospital, and student.

(b) Entrance requirements.

(c) Registration dates.

(d) Graduation date.

(e) Job opportunities.

Minimum requirements for the food service supervisory training program, as established by The American Dietetic Association (1, 2), are also the minimum requirements for our Dietary Assistants' Course. They include:

I. School.
   - A. Theory—90 hr., the minimum to be given during one semester while students are enrolled at Jane Addams Vocational High School.
   - B. Practice—assignments to include on-the-job training in the school cafeteria, bakeshop, and tea room.

II. Hospital.
   - A. Theory—24 hr.
   - B. Practical experience—32 weeks.
   - C. Field trips—as assigned during hospital experience.

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We were also careful in establishing qualifications for applicants, for these girls would be representatives of the dietary departments in which they would be employed. We felt they must have maturity, be able to meet the scholastic standard set by the course outline, and show characteristics which are indicative of leadership.

The road traveled since 1952 has not been easy. In reviewing the program, probably the greatest obstacle was "selling" the program to the community and creating an awareness of the opportunity which the course gives students who do not have the ability, interest, or finances for college work, but who are interested in food work and recognize the value of the training in a special skill which this course offers. Therefore, our recruiting program has been a very important key to the success of the program.

The training of the students in their hospital assignments has required constant surveillance, and the recommendation was made that one staff member should be appointed to direct the students' program so that the course requirements would be met and the students would be protected from being *used* as employees. We have found it necessary to re-emphasize the importance of the student status, for it is so easy to exploit a student rather than to train her.

The Advisory Committee periodically reviews the progress of the program, and today, the original plans from which the course was developed have been improved through revisions in the course content, the practical experience program, recruiting activities, and the development of the pattern of evaluation of the practical experience.

In reviewing our progress, the original outline, as established at Jane Addams Vocational High School, has been carefully considered and revised to give the students background material which is more applicable to hospital food service. We found that some well planned programs on paper need changes for practical adaptation. The practical experience assignments have also been carefully reviewed, and minimum requirements have been established for lecture hours as well as on-the-job training assignments.

Achievement

Today, 1956, the Dietary Assistants' Course is recognized in Cleveland as one which gives a real opportunity to young women and one which has gained the respect of the high schools, the hospitals' administration, and the community.

To date we have had thirty-two graduates. As this is being written late in June, eight students are in training and thirteen are enrolled for the fall class. (Classes are planned for fifteen students each semester. This year, applicants are available, and we hope to have a full quota.) Fifty-six students all told have entered Jane Addams for training up to June 1956, forty of whom have continued with their practical experience in the hospitals.

We have graduated twenty-six—in September, the number will become thirty-two. There have been sixteen failures or withdrawals.

The students themselves have done an excellent job and, needless to say, placement has not been difficult. Two graduates have enrolled in college to study dietetics and one is entering a school of nursing. Three have married (this problem we have in common with the directors of dietetic internships), one has gone into commercial food service, one is in office work, and one is at home because of illness in the family. Seventeen have appointments on hospital staffs in greater Cleveland.

Today, the applicants for the course more nearly meet the requirements that we have set than our first applicants. This is due, I am sure, to the reputation our graduates have made for themselves. The school and the hospitals, too, are doing a better job of training and the position on graduation is now established in the local hospitals.

We are very proud of our Dietary Assistants and of our program. In fact, their contribution has made it possible for us in the hospital to do a larger job without an increase in the staff of professional dietitians. The dietitian, too, has grown in stature since she does the work for which she has been educated.

Keys to a Successful Program

In Cleveland, we believe the success in training the Dietary Assistants depends on:

(a) A definite recruiting program.
(b) The desire to train the supervisor.
(c) A well planned course.
(d) Sufficient time to do a good job of training.
(e) Job responsibility for the graduates commensurate with the training.
(f) Positional status in the organization requiring respect from employees.

At its most recent meeting, the Advisory Committee recommended that as an added support for the future growth of the course and to assure uniformity in the training, a course outline should be compiled which will include administrative policies, hospital contracts, and participating agencies' responsibility. For example:

I. Requirements for the school.
   A. Course content.
   B. Work assignment.
   C. Teaching staff (the number).
II. Requirements for the hospital giving the practical work:
   A. Number of lecture hours and content.
   B. Work assignments (areas and length of assignments).
   C. Staff (minimum number participating).

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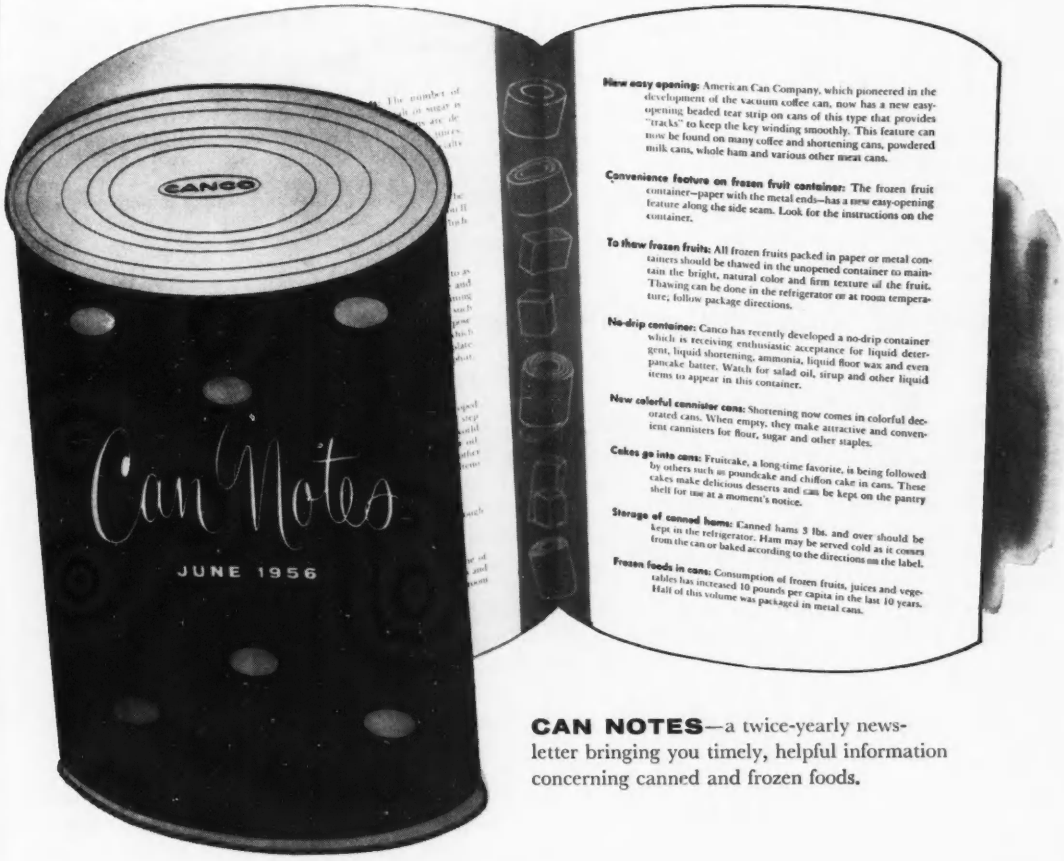
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Can Notes
JUNE 1956
New easy opening: American Can Company, which pioneered in the development of the vacuum coffee can, now has a new easy-opening beaded tear strip on cans of this type that provides "tracks" to keep the key winding smoothly. This feature can now be found on many coffee and shortening cans, powdered milk cans, whole ham and various other meat cans.
Convenience feature on frozen fruit container: The frozen fruit container—paper with the metal ends—has a new easy-opening feature along the side seam. Look for the instructions on the container.
To thaw frozen fruits: All frozen fruits packed in paper or metal containers should be thawed in the unopened container to maintain the bright, natural color and firm texture of the fruit. Thawing can be done in the refrigerator or at room temperature; follow package directions.
No-drip container: Canco has recently developed a no-drip container which is receiving enthusiastic acceptance for liquid detergent, liquid shortening, ammonia, liquid floor wax and even pancake batter. Watch for salad oil, syrup and other liquid items to appear in this container.
New colorful canister cans: Shortening now comes in colorful decorated cans. When empty, they make attractive and convenient canisters for flour, sugar and other staples.
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Storage of canned hams: Canned hams 3 lbs. and over should be kept in the refrigerator. Ham may be served cold as it comes from the can or baked according to the directions on the label.
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IV. Procedures for processing applicants.
  A. Interview pattern.
  B. Admission procedures.
  C. Assignment to hospitals.
V. Recruiting policies and responsibility.
  A. By Hospital Council.
  B. By the school.
  C. By the hospitals.
VI. Recommended job opportunities.
  A. In the hospitals.
  B. In other institutions.
  C. In commercial food work.

To establish a Dietary Assistants' Course, courage, time, and the desire and will to do the job were needed. We think we have made progress. We *know* the time and effort spent has been worth while. The excellent work the graduates are now doing has proved this.

Certainly there is still work to be done to reach our goals. We recognize this. We also recognize the contribution these trained supervisors have made to improve dietary services and that they will continue to contribute more as we contribute more to their training.

REFERENCES

(1) COMMITTEE TO STUDY THE AUXILIARY WORKER: Tentative Trial Outline of Class Room Instruction—The Training of the Food Service Supervisor (Vocational School Level). Chicago: Am. Dietetic Assn., 1954.
(2) COMMITTEE TO STUDY THE AUXILIARY WORKER: First Tentative Trial Outline of Hospital Experience—The Food Service Supervisor. Part II. Supervised Practice. 2nd rev. Chicago: Am. Dietetic Assn., 1954

Political Aspects of Establishing a Food Supervisors' Course—Pittsburgh

RUTH SILVESTER

Chief Dietitian, Allegheny General Hospital, Pittsburgh

WE RETURNED to Pittsburgh from The American Dietetic Association's Annual Meeting in Los Angeles in 1953 inspired by the reports of the courses for food service supervisors. It was clearly evident that graduates of such a course would be of considerable help in the critical shortage of graduate dietitians.

Our first step was to consult the Board of Education of the Pittsburgh Public Schools. During an interview with the director of vocational and industrial arts education, we discussed the courses being given in other cities for food service supervisors and the possibility that Pittsburgh might also offer such a course. As a follow up, a formal letter was sent to the director, stating: (a) the need for a course of instruction for food service supervisors and (b) opportunities for placement after graduation.

While we were attempting to interest the Board of Education in adding this new course to its curriculum, the members of the Board were in the midst of a campaign to convince the voters of the need for an increase in taxes for the Pittsburgh school system. Unfortunately, the levy was vetoed, and because of finances, the Board became evasive about its support of our program. In spite of this unfavorable development, we continued to hope and plan.

Survey of Need

An informal survey of several local hospitals indicated that they would be willing to assist in a training program and that they would employ the graduates of a course for hospital food service supervisors.

We had already discussed the shortage of hospital dietitians with the president of the Hospital Council of Western Pennsylvania and suggested that a possible solution of the problem might be the establishment of a course for hospital food service supervisors to be conducted in a local vocational school. In a later meeting with a representative of the Hospital Council, we analyzed the findings of our informal survey and requested that the Hospital Council sponsor such a course.

The Hospital Council made a survey of its own of the administrators of all hospitals in Allegheny County to learn the answer to the same questions which we had posed. The replies showed that there would be jobs available for sixty-three to sixty-eight graduates of such a course, and that several administrators would be willing to assist in the training program.

In the meantime, the members of the Pittsburgh Dietetic Association's Planning Committee worked out the purpose of the course and the job responsibilities. The requirements of the applicant, of the school, and of the training hospitals were also outlined. The Committee then planned a tentative curriculum for the course, using as a guide, The American Dietetic Association's publications, *Tentative Trial Outline of Class Room Instruction—The Training of the Food Service Supervisor (Vocational School Level)* and *Part II. Supervised Practice* (1, 2).

Following this preliminary work, a formal letter was sent by the Hospital Council of Western Pennsylvania to the superintendent of the Pittsburgh Public Schools requesting that a course for hospital food service supervisors be added to the present

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curriculum. Included in the letter was information on:

(a) Need for the course.
(b) Job opportunities for the graduates.
(c) Job analysis.
(d) Copy of the suggested curriculum.
(e) Suggested sources of possible financial aid.
(f) Name of a teacher qualified to teach the course.

We were very disappointed and discouraged when the superintendent denied the request. The refusal was again based on the financial situation faced by the Board of Education.

State Funds Available

Some time later we learned that state funds were available for training qualified unemployed persons for which we might be eligible. To qualify for these funds, it was necessary for us to establish that there were no qualified women available for the jobs as hospital food service supervisors which were open.

Fortunately, there had been previous requests to the Pennsylvania State Employment Service for women to fill these jobs, and a telephone call to that office reopened the request. A copy of the job analysis was sent to that office. Several candidates were selected by the State Employment Office and interviewed by the Pittsburgh Dietetic Association's Committee. These interviews revealed that there were in fact no qualified women available.

As a result, the Commercial and Professional Office of the State Employment Service requested the cooperation of the Pittsburgh Board of Education in organizing and operating a course for training hospital food service supervisors.

Because of the time that had elapsed, the Hospital Council made a second survey to reaffirm the need for trained food service supervisors and the promise of the hospital administrators to help in the training program. The re-survey verified the need; thirty hospitals indicated in writing that sixty-four to sixty-eight graduates could be employed. Also, the same seven hospitals were still willing to provide on-the-job training for twelve to fourteen students and to pay the trainees a stipend of $80 gross per month for a six-month period.

Formal application was then made for the state funds, and the following data submitted to the Committee in Harrisburg, the state capital:

(a) Job analysis.
(b) Proposed curriculum.
(c) List of operational jobs which could be delegated to the trained hospital food service supervisor by the dietitian.
(d) Budget for the course.

Prompt action followed: the necessary funds were made available from Harrisburg, and the Pittsburgh Board of Education granted final approval for the course. The first class was scheduled to be registered in February 1956.

Mechanics of Starting the Course

The Board of Education reviewed the facilities available at the Irwin Avenue Girls Vocational High School, and necessary changes were made to accommodate the new course. It was also decided by the Board of Education that not more than twenty-five students would be accepted, and since the course was financed by state funds, there would be no tuition for out-of-the-city residents.

The following sub-committees were formed: Uniform Selection Committee; Screening and Selection of Applicants Committee; and Publicity and Recruitment Committee.

The Uniform Selection Committee chose a simple white cotton, princess-style uniform with a peach gingham collar. The collar was to be fastened with a pin, giving the student's name and title.

Publicity was handled under the direction of the Public Relations Department of the Board of Education. Releases were given simultaneously to the newspapers and radio, and "spot" radio announcements were written by members of the Publicity and Recruitment Committee. These announcements were cleverly woven into the regular radio programs, and the response to the publicity was most gratifying. Much of our success in obtaining applicants was due to the excellent cooperation of the newspapers and radio.

Wise selection of students, of course, plays a vital role in establishing a course and in its future success, as well as in that of the student. A procedure for acceptance of applicants was worked out by the Screening and Selection of Applicants Committee. First, a special interviewer was chosen by the State Employment Office, who met with the Committee and was briefed on the purpose of the course, job qualifications, and requirements. A short written quiz was developed, and points to look for during interviews were listed. The procedure for the selection of students was:

A. All telephone calls and written requests for information were to be directed to the Irwin Avenue Girls Vocational High School.
B. The special interviewer of the State Employment Office was to pre-screen applicants
   1. Administering the written quiz.
   2. Accepting from the applicant the required letter stating why she was interested in the course. If the applicant arrived without the letter, she was asked to write one.
   3. Interviewing the applicant.
C. References of applicants who were passed by the interviewer were to be checked by the Screening Committee. If these proved satisfactory, the applicants were to be:
   1. Interviewed by the Screening Committee.
   2. Rated by the Screening Committee, as follows:
      a. 20 per cent on references.

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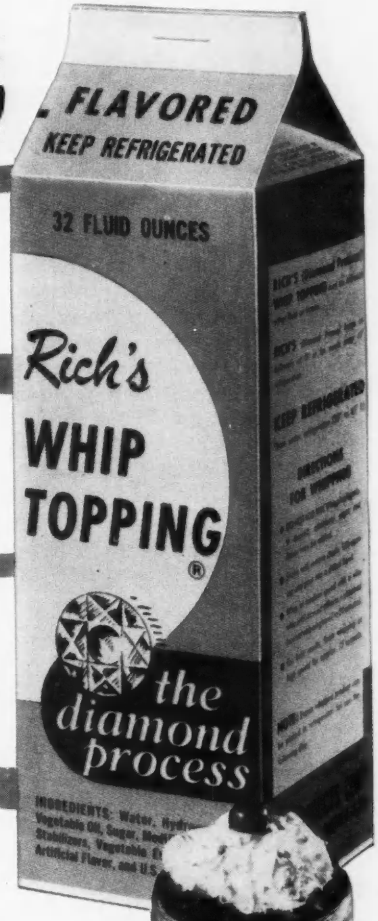

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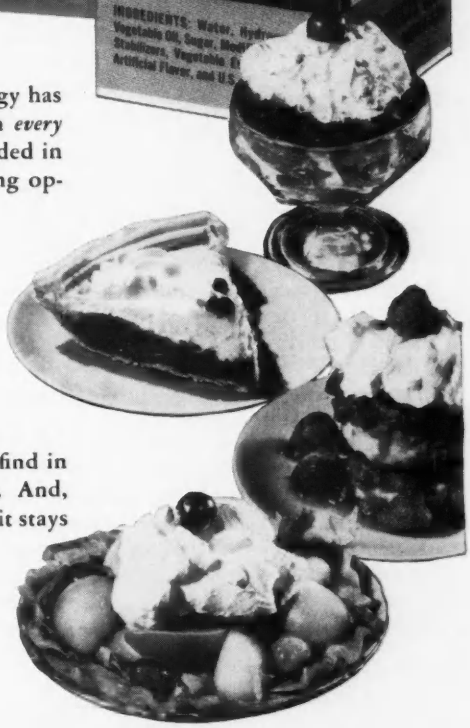

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b. 50 per cent on personal interview.
c. 30 per cent on written test and rating of State Employment Service interviewer.

D. The decision of the Screening Committee was to be final.

The First Class

Over three hundred requests for information and application forms were received. Forty-four candidates were eventually interviewed by the Screening Committee, and nineteen students were accepted for the first class. There were a number of out-of-state applicants who were not eligible for the course, since it is financed by state funds.

Contrary to our expectations, thirteen of our nineteen students are married, and in most cases their children are still at home. Three are single, two are widows, and one is a divorcee. Their ages range from eighteen to fifty years, the majority being thirty to forty-four. Several of the students come from outlying districts and drive as far as 70 mi. daily to attend classes. Absenteeism has been practically unheard of and the *esprit de corps* is good.

As this is being written in July 1956, eighteen of the students have completed the academic work satisfactorily and will begin their supervised hospital practice in August.

REFERENCES

(1) Committee to Study the Auxiliary Worker: Tentative Trial Outline of Class Room Instruction—The Training of the Food Service Supervisor (Vocational School Level). Chicago: Am. Dietetic Assn., 1954.
(2) Committee to Study the Auxiliary Worker: First Tentative Trial Outline of Hospital Experience—The Food Service Supervisor. Part II. Supervised Practice. 2nd rev. Chicago: Am. Dietetic Assn., 1954.

Food Service Supervisory Training in Georgia

GWENDOLYN BIGGERSTAFF

Coordinator, Food Service Supervisor Curriculum, Georgia State College of Business Administration, Atlanta

THROUGHOUT the United States there is a shortage of qualified dietitians. In Georgia, there are approximately 250 hospitals, 200 of which are under 100 beds in size. There are only 140 qualified professional dietitians for the hospital, public health, and other types of work in the state, and a relatively small portion of this number are actually employed in the hospital field. Most of the food service in hospitals throughout the state is therefore directed by persons who are without basic training in the principles of nutrition and food service management, and physicians find this a serious handicap in obtaining therapeutic dietetic service for their patients. It, therefore, seemed desirable to take steps to train qualified mature persons to serve as food service supervisors in the smaller hospitals. Such persons might also be valuable as members of the food service staffs of the larger hospitals and perhaps for some of the state institutions.

A special research and demonstration grant from the U. S. Public Health Service has been given to the Georgia Department of Public Health for developing a training program for food service supervisors for smaller hospitals. This training program will be given at the Georgia State College of Business Administration in Atlanta, in close cooperation with the Georgia Department of Public Health.

Objectives

The following are the stated objectives of this research and demonstration project:

(a) To determine benefits of such a program in supplying the need for persons trained in the fundamentals of nutrition and administration to assume charge of food service in smaller hospitals.

(b) To determine the effect of such a program as a means of upgrading present hospital food service employees in the smaller hospitals.

(c) To demonstrate a means whereby persons with some basic training in nutrition and the scientific phases of food service management can be made available for smaller hospitals.

(d) To establish methods for measuring the results of the program.

(e) To demonstrate to hospital trustees, administrators, and food service supervisors in Georgia and surrounding states ways and means for providing and encouraging advances in food service management and administration.

Course of Instruction

The course of instruction will consist of classroom training on Monday, Wednesday, and Friday of each week, beginning at 5:15 p.m. and continuing until 9:30 p.m. It will include three college quarters beginning about the middle of September 1956 and ending early in June 1957. During the usual daytime hours of work, the persons enrolled in this training course will be employed in food service work under the supervision of a qualified dietitian. Hospitals and commercial establishments which have qualified dietitians have agreed to employ the students for this on-the-job training. Each such organization will be subject to the approval of the Advisory Committee, and the coordinator of the program will give general supervision to the institutions. An in-service training program is being worked out by the Advisory Committee for the hospitals and commercial establishments to use as a guide.

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→ SPACE
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After completing the classroom work, each student will be required to obtain at least three months' additional experience in a selected smaller hospital (100 beds or less).

On satisfactory completion of the classroom work and practical experience, a certificate will be issued by the Georgia State College of Business Administration, Atlanta, indicating compliance with requirements of the course of training as food service supervisors.

The Curriculum

An advisory committee of experienced qualified dietitians has outlined the curriculum and is acting as the admissions committee in selecting students. The roster of this committee follows:

Margaret Dykes Baker, Cedartown
Gwendolyn Biggerstaff, Coordinator, Food Service Supervisor Curriculum, Georgia State College of Business Administration, Atlanta
Helen Jenkins, Director of Food Service, Emory University Hospital, Emory University
Helen Hovis, Dietary Consultant, Division of Hospital Services, Georgia Department of Public Health, Atlanta
Josephine Martin, Assistant School Lunch Supervisor, Georgia Department of Education, Atlanta
Marjorie Massee, Teaching Dietitian, Georgia Baptist Hospital, Atlanta
Maniza Moore, Southeast Area Chief, Dietetic Service, Veterans Administration, Atlanta
Catherine L. Newton, Professor of Nutrition, University of Georgia, Athens
Rebecca Roseberry, Dietary Consultant, Nutrition Unit, Division of Maternal and Child Health, Georgia Department of Public Health, Atlanta
R. C. Williams, M. D., Director, Division of Hospital Services, Georgia Department of Public Health, Atlanta

A qualified dietitian is acting as full-time coordinator of the program and has headquarters at the Georgia State College.

The Advisory Committee has tentatively approved the following curriculum:

FALL QUARTER

I. *Orientation and Ethics, Food Administration*
Purpose of training course as a service to patients, hospital, and community; personal and ethical standards for personnel; role of food service supervisor in hospital dietary department; development of understanding of hospital policies and interdepartmental relationships as related to total patient care; communication skill; public relations; departmental organization.

II. *Food Production*
Fundamentals of principles and techniques of food production; large quantity standardized recipes and portion control; safe practices in food handling and waste control; food production as related to menu planning, purchasing, cost control, and personnel scheduling; field trips to produce markets, meat packing establishments, and wholesale grocers.

III. *Nutrition*
Normal nutritional requirements as related to different age groups, occupations, conditions, and related factors; sources and functions of nutrients; application of proper nutrition in routine and modified menu planning for hospital patients.

WINTER QUARTER

I. *Modified Diets I*
Nutrition review as related to modified diets; development of modification of regular, soft, and liquid hospital diets for therapeutic purposes; diets for disturbances of the gastro-intestinal tract, cardiovascular diseases, obesity, disturbances of pregnancy, post-surgical care; and diabetes, as well as diets high in nutritive value, tube feedings, and test meals.

II. *Menu Planning*
Factors and procedures in menu planning; development of basic food pattern and basic menu pattern into routine hospital diets; modifications of regular menus for soft, liquid, therapeutic, infant, child, prenatal, and aged patients.

III. *Purchasing, Cost Control, and Food Service Records*
Policies and procedures of hospital food purchasing; written specifications for food items; checking quality and portion control; shortage and handling techniques. Policies and procedures of food service accounting for hospitals; classification of meals served; classification of raw food expenses and operational expenses; raw and finished food costs; control of costs.

SPRING QUARTER

I. *Modified Diets II*
Review of Modified Diets I; concentration and emphasis on most frequently prescribed modified diets, such as diabetic, low caloric, low-sodium, ulcer regimen, low-fat, and instruction to patients.

II. *Food Service Personnel Management, Training Techniques*
Policies; job descriptions and analyses; work delegation and job breakdown; employee work scheduling; human relations and communications; interviewing and selection; rating of employees and counseling; development of skills in effective handling of employees: use of oral and written instructions; in-service training course; human relations.

III. *Use and Care of Equipment, Safety, and Sanitation*
Proper operation of hospital food service equipment; cleaning procedures; employee training for proper use, care, and cleaning of equipment; routine inspections; writing of equipment specifications; kitchen planning and layouts; proper cleaning procedures involving equipment, food service areas, pest control, and garbage disposal; planned scheduling of cleaning procedures and personnel training; facilities for personnel; dishwashing standards; food storage; importance of role of health department sanitarian; types of hazards found in food service department; development of techniques for conducting inspections to eliminate physical hazards.

Admission Requirements

The requirements for admission of a person for training as a food service supervisor are flexible, but in general, mature women, preferably with a high school education, will be given priority. Women who are not high school graduates but who have experience and capacity will not be barred. Some women with college training may be attracted to this field.

Admission to this training, which is a non-credit course, is subject to the approval of a special Admissions Committee and the Director of Admissions of the College. Preference will be given to persons

4 Firsts

out of 6!

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☆ ***The Houston Club,*** Houston, Texas
2 Blakeslee 86 PT Dishwashing Machines
Designers: Henry O. Barbour; Alvin W. Anderson
Fabricator and Installer: S. Blickman, Inc.

☆ ***Umphrey Lee Student Center***
Southern Methodist U., Dallas, Texas
Blakeslee 86PT3 Dishwashing Machine
Designers: George Pierce A.I.A., Abel B. Pierce A.I.A.
Fabricators and Installers: Gardner Hotel Supply Co.

☆ ***Town and Country Restaurant,*** Chicago, Ill.
Blakeslee 85PT3 Dishwashing Machine
Designer: Fred Schmid Associates
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who have had experience in some phase of hospital work or are now employed in a hospital. Each case will be handled on its merits, however, with consideration of the student's interest, background, experience in hospital or related work, and future plans.

A student may enter the course only at the beginning of the fall quarter which is about the middle of September of each year.

Persons not residents of Georgia will be eligible for this instruction provided there are vacancies and provided they meet the entrance requirements. Sixteen students, three of whom are not residents of Georgia, have been accepted for this training as of September 1, 1956.

Employment for Students During Course

It is expected that employment in the dietary departments in hospitals in and around Atlanta or other food service establishments which hire them for day time work may provide room and board for students. The students' regular tuition will be paid from the funds granted by the Public Health Service. This means that ordinarily students will need to meet only incidental expenses. It is hoped, however, that various communities and hospitals may provide scholarships for students in the form of funds for incidental expenses.

Looking Ahead

This program will parallel the type of training now being given at the Georgia State College of Business Administration, Atlanta, for hospital administrators, which has proved very popular and has attracted students from a number of states. It is necessary that the feasibility and benefits of this proposed instruction be demonstrated before it can be established and become self-supporting. After three years' experience, sufficient evidence should be accumulated to evaluate the program and to determine its usefulness in meeting the great need for improved food service in smaller hospitals.

It is hoped that our experience with this plan may develop effective methods of training food service supervisors that are so urgently needed in smaller hospitals, not only in Georgia, but throughout the nation.

Connecticut's Program of Supervisory Training

With the aid of the Connecticut Hospital Association, the Connecticut Dietetic Association was able to interest the State Department of Education in providing funds to support a course for food service supervisors. This course was begun in April 1955, when classroom instruction at the vocational school level was offered in both New Haven and Hartford, with two instructors in each city.

Candidates were drawn from among hospital employees who showed promise of supervisory ability. Applicants were carefully screened, with tests, such as the Otis test and the Guilford-Martin Personnel Inventory, being administered in addition to personal interviews.

The entire course for training food service supervisors consists of: 90 hr. classroom work, taught by a qualified dietitian; 25 hr. of job instruction training provided by a staff member from the State Department of Education; and six months of on-the-job training under the supervision of qualified dietitians in one of eight hospitals in the state. The classroom work is based on the A.D.A.'s Tentative Trial Outline, while the hospital training follows an outline and assignment sheets worked out by the Food Administration Committee (Dr. Doris Johnson, Lucille Refshauge, and Esther Woodruff, Chairman).

After finishing the school work, trainees are evaluated and those who have proved unsatisfactory are dropped from further participation in the course. Of the first class of forty-five, thirty-four successfully completed the school work and went on to a six-month, on-the-job hospital assignment.

On December 31, 1955, the first group of twenty-eight trainees completed their course and were awarded certificates. All have now been employed and are serving satisfactorily in sub-professional supervisory capacities, the majority in hospitals in Hartford and New Haven, although several have accepted positions in school lunch and industry.

A second class is receiving training this year, with completion anticipated for the end of the year. Already recruitment for the 1957 class is under way.

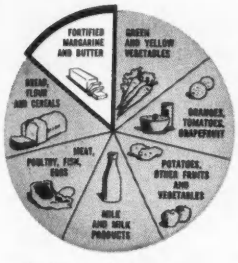
The program has enjoyed not only the backing of the Connecticut Dietetic Association, but also the full cooperation of the Connecticut Hospital Association and the State Department of Education.

INSIDE SCIENCE

The Vital Story Of MARGARINE FORTIFICATION

How They Made Margarine a Better Food

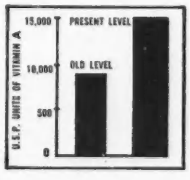
by Science Writer


FORTIFIED MARGARINE AND BUTTER
GREEN AND YELLOW VEGETABLES
ORANGES, TOMATOES, GRAPEFRUIT
POTATOES, OTHER FRUITS AND VEGETABLES
MILK AND MILK PRODUCTS
MEAT, POULTRY, FISH, EGGS
BREAD, FLOUR AND CEREALS
The "Basic 7" Good Foods

Over a hundred million pounds of margarine are used a month as a table spread and in cooking and baking. Included in the "Basic 7" food list, margarine serves as one of the finest and most concentrated energy foods. It is a shining example of a food which has been repeatedly made better.

In the original product, invented more than 80 years ago, beef fats were used. Later lard and vegetable oils came into use. When unpurified these have several drawbacks: unpleasant odor and taste, low melting point and unsatisfactory color. These have been overcome by scientific refining methods, hydrogenation and the use of officially-approved food colors. Strictly phrased Federal Definitions and Standards of Identity assure maintenance of very high quality, uniformity and nutritional value.

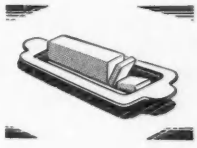
During this history of product improvement, it was natural that margarine makers should decide to make their food more valuable nutritionally by adding vitamin A. For many years some brands of table margarine were marketed with a label statement that they contained 9,000 U.S.P. units of vitamin A per pound. Then the industry decided to give the public the higher nutritional value of 15,000 U.S.P. units per pound, the present legal minimum. Now virtually all brands are fortified to this level.



Here are some of the benefits that vitamin A supplies. Scientific evidence is available showing that it helps to maintain normal vision and to overcome night blindness; that it increases the body's resistance to infections; that it promotes physical and mental development; and that it aids in maintaining normal glandular function.

Soon after the Second World War several processes were developed to produce vitamin A synthetically. One of the most successful, announced in 1947, was evolved by the Roche research team headed by Dr. Otto Isler.

Vitamin A produced by the Roche synthesis has many positive advantages for food processors. Among these are light, clear color; complete absence of any "fishy" odor, taste or after-taste; reasonable and stable price; stability, purity and uniformity; and the assurance of a steady, economical supply.



It is interesting and important to margarine manufacturers that the Hoffmann-La Roche synthesis of vitamin A led to another synthesis and then the commercial production of the closely related pro-vitamin A (beta carotene).

Beta carotene is the *natural, non-toxic* yellow color found in butter and other dairy products. It is *naturally* safe for coloring foods such as margarine, shortening, edible oils, yellow baked goods and many others. In addition to its value as a safe coloring agent, beta carotene contributes vitamin A potency—for better health and well-being.

Beta carotene 'Roche' assures food processors of fully safe, standardized yellow color; vitamin A activity, high purity, proven stability and uniformity. Beta carotene 'Roche' has been widely accepted; margarine manufacturers now use it for coloring and fortifying their product.

It is not practical to use beta carotene alone for both coloring and fortification because too deep a color would result. Roche chemists met this problem by developing a blend of 'Roche' vitamin A and 'Roche' beta carotene which meets the vitamin fortification requirement and gives margarine the safe, desirable color demanded by the consumer.

In a multi-million-dollar plant at the huge Hoffmann-La Roche operation in Roche Park over 500 pieces of large-scale chemically engineered equipment are working constantly to produce superior 'Roche' vitamin A which is built up into a molecule identical with Nature's own. Other highly complex equipment delivers beta carotene 'Roche.'

Again, developments by the Roche people, who manufacture not only vitamin A and beta carotene but many other essential vitamins, *by the tons*, have contributed to the making of more nutritious foods—and thus to the public welfare.

This article, reprints of which are available without charge, is published as a service to the food industry by Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec.

Advertisement

Special Association Report

Tools for Evaluating the Hospital Department of Dietetics

An American Dietetic Association Committee, composed of representatives of the Joint Committee of the American Hospital Association and The American Dietetic Association[1], was appointed two years ago to formulate a pattern which could be used in evaluating a hospital department of dietetics. The result of the committee's work is presented below in the form of "Suggested Standards for the Hospital Department of Dietetics" and "Check Sheet for the Hospital Department of Dietetics."

In working out the "Suggested Standards," the Committee used as its guide the outline developed for the department of dietetics by the Joint Commission on Accreditation in its "Standards for Hospital Accreditation"[2]. The Committee recognizes that many limitations may prevent the development of an ideal department of dietetics in every hospital. These include obstacles of time and space, finances, talent, and opportunity—to mention but a few. It is, of course, important to recognize qualifying conditions; nevertheless, all limitations need not necessarily be accepted as insurmountable, and dietitians should work always toward the goal of meeting such standards.

The possible uses of this report are unlimited. Because of the recognized need for continuing staff education, the points comprising the "Suggested Standards" and the items on the "Check Sheet" could be used as the basis for discussions in staff meetings. Their inclusion in the curricula for the dietetic intern as well as the student in hospital administration would be practical and valuable. These materials could be presented to the hospital administrator by the dietitian in discussions of the goals for the department of dietetics, improvements under consideration, and future planning.

The "Suggested Standards" and "Check Sheet" are not intended as limiting instruments, but rather as stimuli to individual interpretation and adaptation. They present a desirable goal towards which we may all aspire.

Suggested Standards for the Hospital Department of Dietetics

The department of dietetics in a hospital has three responsibilities: administrative, therapeutic, and educational. Its fundamental purpose is to provide efficient administration of the general food service and to promote optimal nutrition for patients and personnel. The following standards will assist in achieving this purpose:

1. *Organization of the department of dietetics.*
   a. There shall be an organized department directed by a professionally qualified dietitian and integrated with other departments of the hospital. In a small hospital having no full-time dietitian, the department may be directed by a "shared" or "part-time" dietitian, assisted by a trained food service supervisor.
   b. There shall be a written plan of organization designating the areas of responsibility.
   c. There shall be authority commensurate with responsibilities granted to the supervisory staff.
   d. There shall be provision for supervision of the department of dietetics during all working hours.

2. *Facilities*
   a. Facilities shall be provided which meet the requirements of the local sanitary code for the storage, preparation, and distribution of food and for the disposal of food waste and trash.

[1] Committee members: Winifred H. Erickson, Chairman; and Grace Bulman. Ex-officio members: Cora Kusner, Wilma Robinson, Isola Robinson Timmons, and Ruth M. Yakel.

[2] Standards for Hospital Accreditation. Chicago: Joint Commission on Accreditation of Hospitals, 1953.

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Cookies—half MORCAL, half flour—increases calories up to 100%
Cheese sandwich filling with MORCAL has 51% more calories
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b. Space and equipment shall be adequate to receive and store both food and supplies so that such principles of good management as checking weights, maintaining inventories, and proper records of receipts and issues may be maintained.
c. Space and equipment shall be adequate for the preparation and service of food with a minimum of time lapse between preparation and serving, so that food will be appetizing, nutritious, and at the proper temperature when it reaches the patient.
d. There shall be evidence of systematic replacement of equipment as required for efficient operation.

3. *Personnel.*
a. There shall be a professionally qualified dietitian as the head of the department. Professional personnel shall be utilized for professional and managerial duties, and there shall be sufficient non-professional and clerical employees to perform delegated duties.
b. There shall be a systematic program of in-service training and evaluation of that program for all personnel.
c. Personnel policies shall be in writing and consistent with those of other departments of the hospital.

4. *Records.*
a. There shall be a record of all routine and modified diets as served, so that nutritional adequacy, cost, and acceptability may be checked.
b. There shall be such financial records as are required for good management.
c. A physician's order, in writing, shall be required for all modified diets.
d. There shall be a diet manual adapted to patients' hospital needs and used by both the medical staff in ordering and the dietary staff in fulfilling dietary prescriptions. (Available sources of such material are: The American Dietetic Association, American Hospital Association, and state dietetic associations.)
e. The professionally qualified dietitian shall have access to the medical records so that there may be correlation of diet with prescribed medical treatment.
f. There shall be current editions of standard references in administration, diet therapy, and nutrition available for use by the dietary department.

5. *Management policies.*
a. The budget for the department of dietetics shall be sufficient to provide a nutritionally adequate and palatable diet, and food service shall be evaluated regularly to meet these ends.
b. The department of dietetics shall maintain communication with all patients, with special care and instruction provided for those receiving modified diets.

6. *Conferences.*
a. The dietitian in charge of the department of dietetics shall attend administrative and medical staff conferences when matters to be discussed affect either the management of the department or the dietary care of the patient.
b. There shall be scheduled departmental staff conferences.
c. The dietitian in charge of the department of dietetics shall meet periodically with the administrator or other designated officer to evaluate the work of the department and discuss future plans.

Check Sheet for the Hospital Department of Dietetics

A suggested check sheet for use by dietitians

1. *Organization of the department of dietetics.*

Name of person in charge: _____

a. Is the department organized and directed by a professionally qualified dietitian, i.e., qualified for membership in The American or Canadian Dietetic Association?
yes _____ no _____
b. Is there a written organization plan designating areas of authority? yes _____ no _____
c. Is supervision designated for all working hours?
yes _____ no _____

2. *Facilities.*

a. Space and equipment. Is space allocated and equipment provided for:

	Satisfactory	*Improvement recommended*
(1) Receiving of food?	_____	_____
(2) Storage of food (dry storage and refrigeration)?	_____	_____
(3) Preparation of food?	_____	_____
(4) Cooking of food?	_____	_____
(5) Serving of food?	_____	_____
(6) Dishwashing?	_____	_____
(7) Waste and garbage disposal?	_____	_____
(8) Storage of housekeeping supplies?	_____	_____

b. Is maintenance of equipment checked periodically?
yes _____ no _____
c. Is there evidence of systematic replacement of equipment? yes _____ no _____
d. Is housekeeping and sanitation satisfactory?
yes _____ no _____
e. Is the department regularly inspected by the local or state sanitarian? yes _____ no _____

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Already Mealpack's unique *vacuum protection* has solved baffling and costly dietary problems in countless hospitals. Now, the new 21 tray Redi-Serv Traycart offers Mealpack's advantage at a *new low cost* any small hospital can afford!

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Mealpack's ingenious new 12 oz. Individual Beverage Servers do double duty! Now you can centrally control authorized between-meal nourishments. Deliver and serve from your kitchen! No need for storing and issuing foods from costly floor facilities!

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- Requires no electric preheating; therefore hot foods *do not dry out.* No costly heating elements to operate and maintain. Completely adaptable to repeat trips for serving up to 63 *beds per cart per meal* (in 3 trips). One Traycart does the work of *three!*—yet each tray is instantly *ready to serve.*
- Hot and cold liquids (soups, beverages, special liquid diets) are *portion-controlled* at main kitchen, then protected for *each patient* in ideal condition by Mealpack's new insulated, stainless steel Model IS-12 Individual Beverage Server.
- Each entree (meats, fish, gravies, vegetables) maintain *savory kitchen freshness and heat* by vacuum seal in Mealpack's Container up to 2 hours after packing.
- Every tray is complete, ready to serve after setting —yet *positively* protected against food quality failure!
- No tray completing at serving point! Complete control at kitchen insures dietary accuracy.
- All foods for every tray—special, selective or general diets—are controlled at *main kitchen.* No more *serving* mistakes!
- Built-in, insulated Cold Compartment protects all cold foods if tray is subject to delayed serving and eating (butter, milk, salads, ice creams, etc.)
- Easy to clean! No disassembly, no corrosion, no wiring or heating elements to damage.
- Unique "locking" type sliding doors protect all tray contents between main kitchen and serving points.
- Popular Mealpack "five point" precision caster suspension facilitates easy handling, storage and operation in cramped or limited corridors, kitchens, elevators, etc.
- Sanitary, sturdy, "lifetime" welded stainless steel construction. Nothing to maintain.

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hot foods hot **mealpack** *cold foods cold*

f. Are there rest rooms and locker facilities for personnel? yes ____ no ____
g. Is the dining room space satisfactory? yes ____ no ____
h. Is there office space for the dietitian? yes ____ no ____
i. Are there adequate means of communication in the department (inter-communication, etc.)? yes ____ no ____

3. *Personnel.*
a. Is the department subject to a labor-hour budget? yes ____ no ____
b. Are there adequate professionally qualified staff members? yes ____ no ____
c. Are food service supervisors employed? yes ____ no ____
d. Are non-professional personnel assignments evaluated periodically to assure sufficient employees? yes ____ no ____
e. Is there an adequate but not excessive number of stenographers and clerks so that professional staff time is not used for these duties? yes ____ no ____
f. Is there an orientation program for new employees? yes ____ no ____
g. Is there a functioning personnel training program? yes ____ no ____
h. Is there a system for evaluating the personnel training program? yes ____ no ____
i. Does the personnel training program include accident prevention and employee safety measures? yes ____ no ____
j. Is there an adequate health program for employees in the department of dietetics? yes ____ no ____
k. Is there an employee merit-rating system? yes ____ no ____

4. *Records.*
a. Is a record of all menus, as served, filed for a reasonable time? yes ____ no ____
b. Are regular menus checked for nutritional adequacy and patient acceptance? yes ____ no ____
c. Are modified menus checked for nutritional adequacy and patient acceptance? yes ____ no____
d. Is there a perpetual inventory maintained of all foods and supplies? yes ____ no ____
e. As an alternative to a perpetual inventory system, is an adequate inventory of another type maintained? yes ____ no ____
f. Is there a record of the cost of maintenance of equipment? yes ____ no ____
g. Are adequate financial records maintained by the department? yes ____ no ____
h. Is a written order from the physician required for all modified diets? yes ____ no ____
i. Is a manual on routine and modified diets used by the medical and dietary staffs? yes ____ no ____
j. Has the dietitian access to medical charts? yes ____ no ____
k. Are current editions of standard references available for use by the department of dietetics? yes ____ no ____

5. *Management policies.*
a. Are all funds for the department of dietetics budgeted? yes ____ no ____
b. Is the budget substantial enough to provide for nutritionally adequate and palatable meals? yes ____ no ____
c. Are foods and equipment purchased according to specifications to insure quality desired? yes ____ no ____
d. Patient education
(1) Are all patients on routine diets visited? yes ____ no ____
(2) Are all patients on modified diets visited at frequent intervals? yes ____ no ____
(3) Are comments pertinent to the visit recorded on the patient's chart? yes ____ no ____
e. Do you use written communications to make suggestions, to confirm oral discussions and decisions, to present reports, and as reminders? yes ____ no ____

6. *Conferences.*
a. Does the dietitian in charge of the department of dietetics attend the administrator's conferences? yes ____ no ____
b. Do members of the department of dietetics attend medical staff conferences and/or rounds? yes ____ no ____
c. Are staff conferences for the department of dietetics held periodically? yes ____ no ____
d. Is the operation and management of the department of dietetics revised and analyzed by its staff? yes ____ no ____
e. Does the dietitian in charge of the department of dietetics meet periodically with the administrator or other designated officer to evaluate and appraise the work of the department? yes ____ no ____

Fats and Serum Cholesterol Level

To confirm findings of an inter-racial survey in South Africa, several different fats and oils were fed under controlled conditions to volunteers, and the effect on serum cholesterol levels studied. Animal fats and hydrogenated vegetable fat behaved differently from vegetable and marine fish and mammal oils. The most likely common difference between these fats and oils is the proportion of unsaturated and saturated fatty acids. Sunflower seed oil and a segregated highly unsaturated fatty acid fraction from pilchard oil consistently depressed the serum cholesterol level when fed alone, with a supplement of cholesterol, or with one of animal fat. It is suggested that certain discrepancies in the dietary fat theory of the etiology of coronary heart disease may be explained by variations in the nature of the fatty-acid composition of the fats concerned.—*Abstracted from: Bronte-Stewart, B., Antonis, A., Eales, L., and Brock, J. F.: Effects of feeding different fats on serum-cholesterol level. Lancet 17: 521 (April 28), 1956.*

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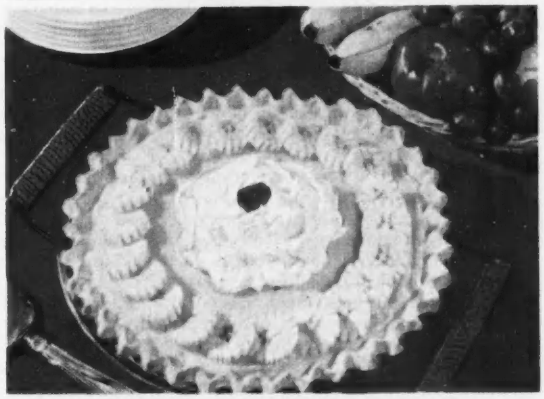

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Book Reviews

How I Reduced with the New Rockefeller Diet. By Roy de Groot. New York: Horizon Press, 1956. Cloth. Pp. 272. Price $3.50.

It has taken the journalistic ability of Roy de Groot as shown in his article in a popular magazine and in the book entitled *How I Reduced with the New Rockefeller Diet* to bring into the spot-light a report of Dole *et al.* in the *American Journal of Clinical Nutrition* (2: 381 [Nov.–Dec.], 1954) on the "Treatment of Obesity with a Low Protein, Calorically Unrestricted Diet." The book, presenting the author's experience in using the diet is divided into two parts: Part I, "The Rockefeller Diet," and Part II, "The Diet for Gourmets."

Part I is made up of seven chapters, only the last of which presents the details of the prescribed diet. The impression given by this part of the book is that it represents a somewhat too obvious effort by the author to expand into book-length volume an account of his experiences as a subject on this diet and his interpretation of the scientific background of the diet. His explanation of the processes of digestion and metabolism is extremely fanciful. Quoting the research of Chittenden and Hindhede, he makes a very strong case for a low-protein dietary regimen and the return to the so-called "primitive appetite."

The principle of the diet is that by means of low protein, the appetite is controlled, and although the amounts of butter, jam, and sugar are unrestricted, the desire for them is reduced. It prescribes not more than 35 gm. protein per day, an amount not likely to maintain nitrogen balance on a low-calorie regimen nor to furnish adequate amounts of the essential amino acids. It is doubtful if calcium, iron, thiamine, riboflavin, and niacin are present in recommended amounts. Dole and associates report that tests made under their supervision show normal liver function and normal concentrations of plasma protein, but they make no comment concerning nitrogen balance and adequacy in other respects.

Although de Groot's report is written in an extremely popular style, it appears to be factually accurate. He points out the importance of medical supervision on any weight reducing regimen. Any necessary precautions or possible adverse effects, however, are so overshadowed by his enthusiasm that they are likely to be completely overlooked. Neither the magazine article nor the book was officially authorized by the Rockefeller Institute, but the fact that they carry the name of the Institute gives the diet a status in the public mind that is scarcely deserved.

Recently Dr. Dole and associates have apparently come to appreciate the potential dangers of such a popular presentation of this diet and have issued statements (J.A.M.A. 161: 901, 1700 [June 30, August 25], 1956) calling attention to the failure of the book to give sufficient warning of the hazards of low-protein diets if not continuously supervised by a physician. They point out that the amount of protein provided in this diet is near the minimum for a healthy adult and that any further reduction carries the risk of serious liver damage. However, it seems doubtful if their warning will reach the segment of the population likely to be reading and following the diet as presented by de Groot.

Part II outlines in further detail the author's experience in using this diet in his home. It includes extensive menus, recipes, and shopping lists. His recipes call for many ingredients not readily available to the average housewife but would encourage one to be experimental in food preparation. They are not necessarily limited to low-calorie diets, but are suggestive for any use. With reference to this part of the book, Dr. Dole calls attention in the J.A.M.A. to the importance of routine in using the diet and points out that the menus proposed are not the ones used at the Institute.—*May S. Reynolds, Ph.D. Professor of Home Economics, University of Wisconsin, Madison.*

The American Peoples Cookbook. By Culinary Arts Institute. Chicago: Spencer Press, Inc., 1956. Cloth. Pp. 600. Price $4.95.

This compendium of 600 pages was developed around a nucleus of prize-winning recipes submitted in a contest staged among members of the Peoples Book and Sears Readers Clubs. Recipes came from all parts of the U.S., many derived from cuisines of other countries. The winners comprise more than a third of the recipes included in this collection, the remainder being dishes which were developed by the staff of the Culinary Arts Institute to round out the prize winners so that a balanced cook book could be presented.

The top prize winners include: orange pork chops, imperial lobster, sour cream kuchen, Saint Nicolas cake, pineapple-orange fantasies, ham surprises, old-fashioned English plum pudding, Irish batter bread, and bananas Guadalcanal.

The book is organized according to appetizers, soups, breads, sandwiches and sandwich fillings, egg and cheese dishes, and the other customary divisions. Recipes follow step-by-step outlines, with ingredients listed as they are to be used. At the beginning of each chapter, the general expositions will be helpful to cooks, either as new information or reminders. Such basic information as selection, storage, and methods of cooking precedes the meat recipes; a check list for successful pie making introduces the section on pastries, pies, and tarts; and an essay on "The Good Salad" orients the salad maker.

This volume is handsomely illustrated with line drawings depicting the American historical and geographical scene (some in color) and with black and white and color photographs, many of which were supplied by commercial food concerns. To pick up and browse through this attractive book is a mouth-watering experience, and this reviewer can hardly wait to get it home to try such taste-teasing ideas as curried chicken with almond, rice-cheese puffs, black raspberry cream pie, and apple-butter refrigerator roll.

Philip Harben's Cookery Encyclopaedia. New York: Philosophical Library, 1956. Cloth. Pp. 480. Price $10.

The author of this *Encyclopaedia* is a TV cookery demonstrator with a considerable following. In this volume, he has attempted to prepare a "text book, a reference book, a thesaurus of established culinary knowledge." Along the way he has included a number of his own recipes, many of which have not been published before. Material is presented in alphabetical order, beginning with Adam and Eve pudding and ending with zabaglione. General information follows the alphabetical listings and covers such subjects as: seasons for food; seasonal menus; gastronomic maps of France, Italy, and Great Britain; culinary vocabulary; caloric values of some of the recipes; and various cuts of meat and their uses in cooking. Although presented in a "textbookish" format, some of Harben's ideas are intriguing, and the recipes appear to be the "pets" of a gourmet. Attractive black and white and color photographs tend to offset the dull format.

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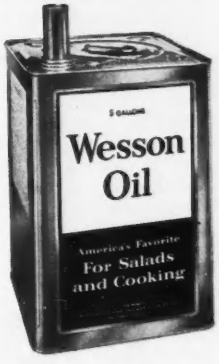

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Current Literature

Contributed by Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Elizabeth H. Tuft, Chicago Wesley Memorial Hospital, Chicago; and the Journal staff

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 4. July-August, 1956

The history of vitamin B_6. P. György.—p. 313.
* Vitamin B_6 deficiency in the rhesus monkey with particular reference to the occurrence of atherosclerosis, dental caries, and hepatic cirrhosis. J. F. Rinehart and L. D. Greenberg.—p. 318.
* Neurochemical aspects of pyridoxine metabolism and function. D. B. Tower.—p. 329.
* Effects of vitamin B_6 on the central nervous activity in childhood. D. B. Coursin.—p. 354.
* Some metabolic effects of vitamin B_6 in vivo. E. W. McHenry.—p. 264.
* Evidence for abnormal vitamin B_6 metabolism in pregnancy and various disease states. M. Wachstein.—p. 369.
* The metabolism of vitamin B_6 in human beings. R. W. Vilter.—p. 378.
* Nutritional muscular dystrophy in monkeys receiving a diet deficient in both vitamins B_6 and E. P. L. Day and J. S. Dinning.—p. 386.
Some studies of tocopherol in infants and children. H. H. Gordon and H. M. Nitowsky.—p. 391.
Some studies of tocopherol deficiency in infants and children. III. Relations to blood catalase activity and other factors to hemolysis of erythrocytes in hydrogen peroxide. H. M. Nitowsky and J. T. Tildon.—p. 397.
* Effects of limited tocopherol intake in man with relationships to erythrocyte hemolysis and lipid oxidations. M.K. Horwitt, C. C. Harvey, C. D. Duncan, and W. C. Wilson.—p. 408.
* Studies of pantothenic acid metabolism. R. Lubin, K. A. Daum, and W. B. Bean.—p. 420.
* Effect of an elixir on the absorption of vitamin B_{12} by healthy young and old subjects. B. F. Chow, A. Horonick, and K. Okuda.—p. 434.
Vitamin B_{12} serum level and pregnancy. K. Okuda, A. E. Helliger, and B. F. Chow.—p. 442.

Vitamin B_6 Deficiency and Atherosclerosis, Dental Caries, and Hepatic Cirrhosis. Pathologic alterations which suggest that deficiency of pyridoxine may be important in the pathogenesis of human disease have been revealed during studies on rhesus monkeys. Animals subjected to pyridoxine deficiency regularly develop alterations in blood vessels which bear a close similarity to atherosclerosis in man. The experimental lesions are closely analogous in character and distribution to those found in man. In the experimental animals the vascular lesions develop after five to six months of complete deprivation. In animals maintained for two years or longer on the synthetic diet, and given inadequate supplements of vitamin B_6, the incidence of dental caries in the second dentition is unusually high. Attention is called to the essentiality of vitamin B_6 in metabolism, particularly of proteins.

Neurochemical Aspects of Pyridoxine Metabolism. Function and activity of nervous tissue depend almost exclusively on energy derived from oxidative metabolism of glucose. It was shown that pyridoxine in its coenzyme form is essential to the activity of a number of important enzyme systems in brain. The deprivation of pyridoxine results in epileptiform seizures in all species, including man. There are suggestions that pyridoxine deficiency is associated with disturbances in metabolism of neural lipids of myelin structures. It is stated that pyridoxine as pyridoxal phosphate must be accepted as essential to proper neuronal function and activity and as intimately concerned with the systems involved in the seizure process.

Vitamin B_6 and the Central Nervous Activity in Childhood. Vitamin B_6 plays a definite part in central nervous system metabolism. Under gross conditions of deficiency, deprivation, antivitamin activity, and isoniazid toxicity, clinical and electroencephalographic changes are to be expected and are readily correctible. In a study made in 1950, pyridoxine doses averaging 100 mg. daily were given to fourteen patients with petit mal seizures. Five were completely cured, three showed improvement. The five with best results had no convulsions from ten to twenty months after treatment began. The quantity of vitamin picked up by the body apparently contributes a necessary key to biochemical reactions within the brain cell, permitting either a release mechanism or an inhibitory one to function.

Metabolic Effects of Vitamin B_6 *in Vivo*. There are discordant aspects involved in the relation of vitamin B_6 to transamination. Hepatic transaminase activity does not keep pace with the total vitamin B_6 content of liver and tissues. This could be explained by conjecturing that the enzyme activity keeps pace with the amount of pyridoxal, but not with the quantities of other vitamin B_6 compounds. Changes in appetite, in carbohydrate metabolites, and in body composition may not be specific for vitamin B_6 deficiency, but they are clearly evident before a decrease in transaminase can be detected. The opinion is expressed that transamination is a pathway in amino acid conversion to carbohydrate and, through carbohydrate, to fat.

Abnormal Vitamin B_6 Metabolism in Pregnancy. In a study conducted with a group of 410 pregnant women, a statistically significant decrease in incidence of toxemia was observed in those treated with B_6. It is yet to be determined whether the administration of vitamin B_6 will influence such diseases as hyperthyroidism in which biochemical tests have indicated an increased demand for vitamin B_6.

Vitamin B_6 Metabolism in Human Beings. Vitamin B_6 is absorbed rapidly and completely by human beings, but it is not known where maximum absorption occurs. Blood levels of vitamin B_6 and of its co-enzyme, pyridoxal phosphate, in fasting human subjects, are so low that methods of assay cannot give accurate results. The functions of vitamin B_6 can be assessed through studies of the derangements that occur during spontaneous or induced deficiency states and of restoration of function during recovery. Studies with infants indicate that deficiency of vitamin B_6 upsets the complex processes of cerebral metabolism and causes convulsions. Studies indicate that deranged vitamin B_6 metabolism induces lesions in skin, mucous membranes, nerve tissue, and lymphatic system and that the metabolism of tryptophan, protein, carbohydrate, and fatty acids may be affected adversely by the deficiency.

Vitamins B_6 and E Deficiency and Muscular Dystrophy. These experiments indicate that the young rhesus monkey is susceptible to vitamin E deficiency, showing a syndrome characterized by progressive muscular weakness and an increase in urinary output of creatine and allantoin, but a reduction in urinary creatinine, progressive anemia, and leukocytosis. All these physical, chemical, and cytologic changes respond to the administration of vitamin E. We do not yet know what part the deficiency of vitamin B_6 may have in the development of the syndrome.

Vitamin E in Human Nutrition. The plasma levels of tocopherol have been studied in relationship to levels of dietary vitamin E and compared with the extent of erythrocyte hemolysis by peroxide. Thiobarbituric acid has been suggested as a suitable reagent for evaluating the oxidation of biologic material in studies of vitamin E deficiency. With this reagent, data have been obtained which have shown an increased reactivity with biologic material from mammals depleted of vitamin E. Correlations between the reactivity and extent of peroxide hemolysis in human erythrocytes have been observed.

Pantothenic Acid Metabolism. Work was done on a syndrome induced in normal subjects, and with one subject with evidence of adrenal cortical overactivity. A clinical state of lethargy, weakness, burning paresthesias, and cramps with signs of tetany was observed. Low serum potassium may account for many of the findings. The evidence suggests that pantothenic acid deficiency in human beings may lead to alterations in the pattern of adrenal cortical steroid secretion, so that hydroxycorticoids, or aldosterone, assume a greater share of net adrenal function.

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Use of an Elixir. Reported are several experiments to evaluate the ability of an elixir containing vitamin B_{12}, other vitamins, and lipotropic substances to enhance vitamin B_{12} absorption in both normal subjects and those with pernicious anemia. The elixir was not derived from the usual animal sources of intrinsic factor. Intrinsic factor is defined as a substance present in gastric juice, which when given with vitamin B_{12} by mouth will produce a therapeutic response in patients with pernicious anemia. Results showed that with healthy subjects the elixir was capable of producing significantly higher serum vitamin B_{12} levels than could be obtained with larger doses of vitamin B_{12} alone. However, the elixir was of questionable value in treating pernicious anemia.

AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 1 n.s., June, 1956

* Ulcerative colitis. C. W. Borden.—p. 273.

Ulcerative Colitis. Psychotherapy, use of corticosteroids, antibiotics, and chemotherapy are the most useful adjunctive measures in treating ulcerative colitis. ACTH is the most satisfactory agent for treatment of severe disease, although approximately 80 per cent of the patients treated ultimately will relapse. Medical management can achieve reasonably satisfactory results in 50 to 75 per cent of the cases. Surgical treatment will be necessary in 25 per cent of the patients.

AMERICAN JOURNAL OF MEDICINE

Vol. 21, July, 1956

* The problem of chronic liver disease in young women. A. G. Bearn, H. G. Kunkel, and R. J. Slater.—p. 3.

Chronic Liver Diseases in Young Women. A group of young women suffering from severe hepatic cirrhosis were studied. Certain features not usually observed in patients with Laennec's cirrhosis were common. These included arthritis, obscure febrile episodes, and occasionally, hormonal disturbances. Striking improvement followed the use of cortisone. Laboratory investigations in the acute stages of the disease usually revealed an extremely high serum gamma globulin and an increase in the plasma cells of the liver. It is possible that specific endocrine influences present in young women modify the usual course of infectious hepatitis.

ANNALS OF INTERNAL MEDICINE

Vol. 45, July, 1956

* Adrenal influences on the stomach: peptic ulcer in Addison's disease during adrenal steroid therapy. S. J. Gray, C. G. Ramsey, and G. W. Thorn.—p. 73.

Adrenal Influences on the Stomach. The present study emphasizes the significance of pituitary-adrenal influences on the stomach, as evidenced by the following observations: (a) a low incidence of chronic peptic ulcer in patients with Addison's disease; (b) a low uropepsin excretion in patients with Addison's disease, with a return to normal or elevated levels during replacement glucocorticoid therapy; (c) an exaggerated gastric response to administered adrenal steroids in persons with Addison's disease and in patients following bilateral adrenalectomy; (d) an increased uropepsin excretion in states of adrenal hyperactivity (Cushing's disease); and (e) reduced gastric volume and acidity in experimental animals following bilateral adrenalectomy.

ARCHIVES OF INTERNAL MEDICINE

Vol. 97, June, 1956

Ammonia intoxication and hepatic coma. Editorial. W. H. J. Summerskill, S. J. Wolfe, and C. S. Davidson—p. 661.

* Renal glycosuria in pregnant diabetic patients. G. T. Perkoff and F. H. Tyler.—p. 758.

* Respiratory alkalosis in hepatic coma. P. Vanamee, J. W. Poppell, A. S. Glicksman, H. T. Randall, and K. E. Roberts.—p. 762.

Renal Glycosuria in Pregnant Diabetic Patients. Clinically demonstrable renal glycosuria occurred in five of ten pregnant diabetic subjects and probably was present in three others. It is known that nondiabetic pregnant women also develop renal glycosuria, but adequate statistics on the rate of occurrence are lacking. Prior to its recognition, the presence of renal glycosuria led to severe hypoglycemic episodes and subsequently contributed to the development of ketosis in three of these patients.

Respiratory Alkalosis in Hepatic Coma. Twenty-five of twenty-nine patients in hepatic coma developed respiratory alkalosis with a coincident elevation of blood ammonia. No correlation between blood ammonia levels *per se* and symptoms of hepatic decompensation was evident. It has been postulated that ammonia may stimulate respiratory exchange and lead to respiratory alkalosis in patients with severe liver failure. The physiologic effects resulting from respiratory alkalosis may be additive to the toxic effects of ammonia.

ARCHIVES OF PEDIATRICS

Vol. 73, June, 1956

* Infectious origin of juvenile diabetes. E. E. Brown.—p. 191.

Infectious Origin of Juvenile Diabetes. The most common cause of diabetes mellitus in children is a systemic infection which injures the Islands of Langerhans. The diabetic state is often perpetuated by repeated upper respiratory infections and chronic sinusitis. Blood-borne bacterial toxins probably prevent regeneration of the injured pancreas. Juvenile diabetes mellitis may be prevented largely by control of childhood infections.

BRITISH MEDICAL JOURNAL

No. 4977, May 26, 1956

* Megaloblastic anemia of infancy in kwashiorkor and other diseases. F. Walt, S. Holman, and R. G. Hendrickse.—p. 1199.

No. 4978, June 2, 1956

* Role of vitamins in embryonic development. D. H. M. Woolam and J. W. Millen.—p. 1262.

Megaloblastic Anemia of Infancy. Anemia in kwashiorkor (malignant malnutrition) is very common, but megaloblastic anemia has been thought to be rare. In a series of forty-two cases, twenty-two were found to have megaloblastic anemia. Megaloblastic anemia of infancy is thought to be a secondary disease. The megaloblastosis of the bone marrow can be cured by giving folic acid. Folic acid appears to be specific for the disease.

Vitamins in Embryonic Development. In animal experiments, the minimum requirements for vitamins must be met or the embryo will either die or be born congenitally deformed. What validity these animal experiments have for conditions in humans it is impossible to say. Malformations occur early in pregnancy, before the woman may even know she is pregnant. In obstetrical practice, vitamins are commonly prescribed in the middle and late months of pregnancy. The only way the nutrition of the embryo can be safeguarded is by our attention being directed towards the diet of women throughout their lives. The nutrition of girls in the later stages of adolescence should be given special consideration.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 74, June 1, 1956

* The effects of glucagon on carbohydrate metabolism in patients with diabetes mellitus. A. Bogoch and H. W. McIntosh.—p. 875.

Vol. 74, June 15, 1956

BZ-55 (carbutamide): experimental and clinical studies of an oral antidiabetic agent.
Experimental studies.—p. 957 ff.
Clinical studies.—p. 977 ff.

Glucagon Effects in Diabetes. The intravenous administration of glucagon to patients with controlled diabetes mellitus results in a significant rise in blood sugar levels. Glucagon may protect against the hypoglycemic effect of insulin in some patients with diabetes mellitus studied in the fasting state. No correlation was found between response to glucagon and such factors as: duration of diabetes, obesity, and exogenous insulin requirement. Determinations of blood lactic acid levels suggests that muscle glycogen plays no role in the hyperglycemic response to glucagon.

FOOD TECHNOLOGY

Vol. 10, August, 1956

* Observations on pre-peeling of potatoes. W. O. Harrington, P. C. Mayer, R. L. Olson, W. R. Mullins, and A. L. Potter, Jr.—p. 347.

* The ascorbic acid content of sauerkraut. C. S. Pederson, J. Whitcombe, and W. B. Robinson. —p. 365.

* Effect of Aureomycin chlortetracycline on fish freshness. M. C. Firman, A. Abbey, M. A. Darken, A. R. Kohler, and S. D. Upham.—p. 381.

Observations on Pre-Peeling Potatoes. Advantages of low-temperature

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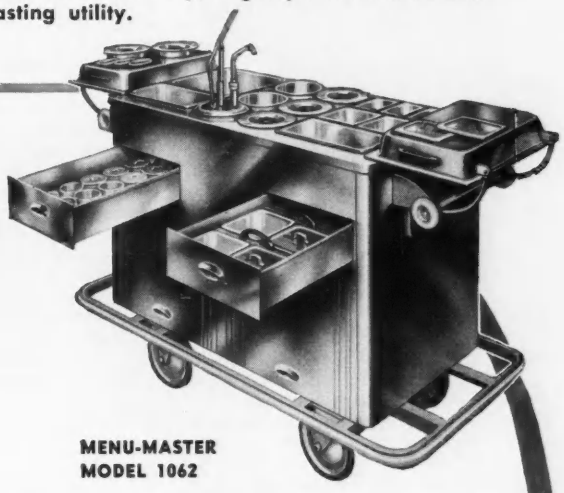

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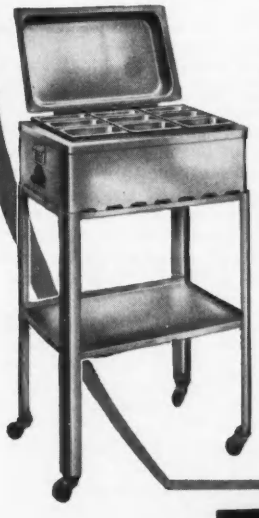

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lye peeling lie in the reduction of peeling loss and trimming labor. Disadvantage is the lessening of spoilage resistance. White Rose potatoes, however, which have thin skins and shallow eyes and are regularly shaped are best peeled by the abrasion process. To obtain maximum protection against microbial spoilage and discoloration, when using the low temperature process, rapid cooling is needed. Refrigeration of the treatment solution is a practical method for reducing product temperature to 40°F within a few minutes for French-fry sticks. Whole potatoes do not cool enough during treatment immersion and must be further cooled by adequate air circulation in refrigerated storage rooms. Color intensity of French-fried potatoes can be reduced by a hot-water blanch before frying. Undersized potatoes and small, cut pieces that are not suitable for French-fry sticks can be processed to make salable hash-brown potato stock.

Ascorbic Acid in Sauerkraut. For this study, 217 cans of kraut were used. Of these, 3.7 per cent contained more than 30 mg. ascorbic acid per 100 gm.; 57.6 per cent showed a content above 15 mg.; and 11.1 per cent contained 5 mg. or less. To determine if any difference in the handling of cabbage and sauerkraut had an affect on the retention of ascorbic acid, a study was made of krauts canned from vats of known history. Storage time, temperature of the kraut at time of filling vats, temperature of the vat rooms, and storage temperature after canning all made differences in the retention. A general relationship between the ascorbic acid content and age of kraut when canned was noted.

Aureomycin Chlortetracycline and Fish Freshness. The development of the broad spectrum antibiotics with activity against a wide variety of bacteria has opened new possibilities in the control of the bacterial spoilage of foods. These studies were made on sea bass, weak fish, croaker, butterfish, scrod, porgy, salmon, and halibut. The effectiveness of chlortetracycline was determined in relation to: prolonging the freshness, organoleptic rating, and microbiologic assay for the antibiotic and microbial count. Antibiotic activity has been detected in the raw treated fish. Microbial counts and organoleptic observations have substantiated the opinion that cholortetracycline can be used in extending the storage life fish.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 4, August, 1956

* Amino acid proportions in food proteins compared to proportions utilized in rat growth. N. Raica, J. Heimann, and A. R. Kemmerer.—p. 704.

* Isolation and identification of nitrogenous components in meat. J. C. Alexander and C. A. Elvehjem.—p. 708.

Review of proteins of wheat flour. J. W. Pense, D. K. Mecham, and H. S. Olcott.—p. 712.

A review of carbohydrates of wheat and other cereal grains. R. Montgomery and F. Smith.—p. 716.

Amino Acids in Foods of the Southwest. By microbiologic assay, the essential amino acid content of thirty foods associated with the Southwest was determined. On the basis of the essential amino acid requirements of the rat, the following conclusions were made for the food groups analyzed. Cheese protein was fairly well balanced, except for a low proportion of methionine. Nut protein had a very high proportion of arginine and a low proportion of methionine and lysine. Fresh and dried legume proteins had a low proportion of methionine, lysine, and tryptophan. Fresh vegetable protein had a low proportion of methionine, lysine, and histidine. Methionine was deficient in all the food groups analyzed. Coconut meat required preliminary treatment to give good microbiologic assay results.

Nitrogenous Components in Meat. Ion exchange and paper chromatography were used to identify the nitrogenous components in meat. A new system for gradient elution was employed to elute the amino acids from the column. Approximately 100 per cent of the nitrogen contained in meat was accounted for by twenty-one amino acids, ammonia, and other nitrogenous constituents such as vitamins, purines, creatine, carnitine, and methylguanidine. Hydroxyproline, taurine, and β-alanine have been shown to exist in the crude protein of beef muscle with values of 0.7, 0.4, and 0.4 per cent, respectively. This is many times the quantity of β-alanine which can be accounted for from the pantothenic acid content of meat. Pork muscle protein has also been found to contain 0.6 per cent hydroxyproline and 0.4 per cent taurine. Hydroxyproline was previously reported as being absent from animal muscle, and no report was found of meat containing taurine.

JOURNAL OF THE AMERICAN GERIATRICS SOCIETY

Vol. 4, July, 1956

* Electrophoretic serum protein patterns in the aged. J. L. Karel, V. M. Wilder, and M. Beber.—p. 667.

Serum Protein Patterns in the Aged. This investigation was made with nineteen men and two women, all free from known pathologic processes, ranging in age from sixty-six to eighty-eight years. All patterns showed excellent resolution into five components: albumin, alpha-1 globulin, alpha-2 globulin, beta globulin, and gamma globulin. On the basis of these observations, it would appear that hypoalbuminemia associated with aging may be chiefly the result of a diminished rate of albumin synthesis. The elevations in alpha and beta globulin levels were not large. More work must be done on the alpha and beta globulin levels as well as on the gamma globulins. With a large number of possibilities, it is almost impossible to attach significance to the increase in gamma globulin content of sera from normal, aged human beings.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 161, July 21, 1956

* Hypervitaminosis A. R. A. Elliott, Jr. and R. L. Dryer.—p. 1157.

* Peeling of nails. Queries and Minor Notes.—p. 1211.

* Weight gain during pregnancy. Queries and Minor Notes.—p. 1212.

Vol. 161, July 28, 1956

* Carbohydrates in lemon juice. Queries and Minor Notes.—p. 1344.

* Vitamin-mineral supplements. Queries and Minor Notes.—p. 1344.

Vol. 161, August 4, 1956

* Foods that color the urine. Queries and Minor Notes.—p. 1431.

Vol. 161, August 11, 1956

* Effect of fertilizers on the nutritional value of foods. L. A. Maynard.—p. 1478.

* Swollen cans of food. Queries and Minor Notes.—p. 1518.

Hypervitaminosis A. This is the report of an adult case of chronic hypervitaminosis A, of which only four cases have been reported since it was first described in a child in 1944. Administration of vitamin A in a dose of 50,000 units three times a day has been cited as a useful adjuvant in the treatment of acne. In the case presented, this approximate dosage schedule was maintained for over seven months, and vitamin A intoxication resulted. Symptoms were soreness of the mouth, blisters on the tongue, frequency of urination, insomnia, and hepatomegaly. In the other cases reported, symptoms were: anorexia, weight loss, weakness, and night sweats. All possible manifestations should be noted by those administering vitamin A in large doses.

Peeling Nails. In younger people peeling nails is often associated with secondary anemia, particularly iron deficiency; in older people, with such nutritional deficiences as lack of normal metabolism, of vitamins A and D. If it is not due to irritations, such as use of detergents, then vitamin A and D and calcium deficiency must be considered. Occasionally it is an abnormality seen in the hypothyroid person.

Weight Gain in Pregnancy. It has been the experience of most obstetricians that a weight gain of 18 to 20 lb. above the ideal weight results in the lowest incidence of toxemia. One source noted that a group of women who were markedly underweight at the onset of pregnancy had twice the incidence of toxemia as those of normal weight. It was noted by others that an approximately normal weight gain in the first trimester of pregnancy will reduce the hazard of toxemia. The opinion is also expressed that a weight gain of less than 5 lb. will not increase the incidence of toxemia. In a recent small sampling of data, women who gained from 0 to 8.5 lb. had an incidence of toxemia of 4.6 per cent as compared to 5.7 per cent in a group who gained 18 to 22 lb.

Carbohydrates in Lemon Juice. To comply with U.S.D.A. standards, frozen concentrate for lemonade must be "the product prepared from lemon juice and one or more nutritive sweetening ingredients." Frozen concentrate for lemonade, when prepared as lemonade, should test not less than 10.5° Brix. By this definition, prepared lemonade from frozen concentrate contains about 10 per cent carbohydrate. Fresh lemon juice without sugar is about 7.7 per cent carbohydrate. If it is diluted 1 to 4 with

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water, its carbohydrate amounts to about 2 per cent.

Vitamin-Mineral Supplements. If a pregnant woman eats a well-rounded diet every day, she will not need extra vitamins in capsule or tablet form except vitamin D, since this vitamin is found in only limited amounts in natural foods. Extra minerals are seldom needed by women who eat a proper diet. Even though there appears to be proof that large quantities of milk or dibasic calcium phosphate predispose to muscular tetany, they should drink a quart of milk daily.

Foods That Color the Urine. Beets, rhubarb, and certain dyes can sometimes impart to urine a color that suggests hemoglobinuria or hematuria. Hard candies colored with fuchsin and other dyes have caused urine to turn red or purple. The reddish-brown coloration that appears after rhubarb is eaten is identical to that which appears after the use of senna, a purgative, and cascara, a laxative drug. Phenolphthalein, also used as a laxative, gives urine a magenta color. Certain drugs taken orally may sometimes cause actual hematuria.

Fertilizers and Nutritional Value of Foods. This report gives both positive and negative results from the use of fertilizers for improving the soil. Several studies are cited to disprove the claim that chemical fertilizers are devitalizing the soil. The organic matter content of the soil is important as a contributor to its fertility and an an aid in maintaining the proper physical conditions. It is also the form in which nitrogen can be stored and gradually released through the agency of microorganisms for uptake by the plants. Barnyard manure, compost, and crop residues are used by farmers to maintain and improve soil fertility to the extent to which they are available. Large amounts of chemical fertilizers are also needed on many soils to produce high yields.

Swollen Cans of Food. There can be no assurance that it is safe to eat food from cans that give evidence of spoilage (bulging ends, contents that appear disintegrated or mushy, or contents that smell like rancid cheese). All such suspected food should be discarded without being tasted. The spores of *Clostridium botulinum* rarely germinate in foods having a *p*H of 4.5 or lower, yet canned acid fruits have been known to be involved in outbreaks of botulism, the reason being that there is a great variation in the acidity of fruits and vegetables. Although there is little chance that commercially canned food will contain the botulinum bacillus, it is possible that cans that are swollen after long exposure to heat and moisture have been infected after the canning process.

THE JOURNAL OF THE CANADIAN DIETETIC ASSOCIATION

Vol. 18, July, 1956

* Food and nutrition in Angola. A. K. Strangway. —p. 21.

Food and Nutrition in Angola. The economic level of the people of Angola is low. Their knowledge of nutrition and agriculture is limited, although the country is mostly agricultural. Many are malnourished, with malnutrition accentuated during the hunger months of October, November, and December at which times the previous year's food has either been eaten or sold and when the new crop is not available. Most protein comes from vegetables, and the diet is low in protein. Palm oil and lard are distributed throughout Angola, but the majority of Africans lack sufficient fat in their food intake. Malnutrition complicates almost every disease. Tuberculosis is spreading rapidly.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 35, June, 1956

* Diminished phenylketonuria in phenylpyruvic oligophrenia after administration of L-glutamine, L-glutamate or L-asparagine. A. Meister, S. Udenfriend, and S. P. Bessman.—p. 619.
* An experimental test of the glucostatic theory of regulation of food intake. L. M. Bernstein and M. I. Grossman.—p. 627.

Amino Acids in Phenylpyruvic Oligophrenia. Two phenylketonuric patients were given single oral doses of L-glutamine, sodium L-glutamate, L-asparagine, glycine, sodium succinate, or D-glucose. Urinary excretion of phenylpyruvic acid was measured for several hours prior to and after administration of the test compound. After glutamine was given, the excretion of phenylpyruvic and phenyllactic acids decreased to about one-third of the control level. Glutamate and asparagine also lowered phenylpyruvic acid excretion, although the effect was not as great as that observed with glutamine. No significant changes were observed in the excretion of phenylacetylglutamine or in the blood levels or urinary excretion of phenylalanine. The excretion of α-ketoglutarate was increased after glutamine administration. In contrast to the findings after glutamine and glutamate were given, the effect of asparagine on phenylpyruvic acid excretion occurred after a lag period. Since asparagine also led to increased blood levels of glutamine, it is possible that its effect in lowering phenylpyruvic acid excretion is mediated through glutamine. The results are discussed in terms of the concept that transamination plays a role in phenylpyruvic oligophrenia.

Glucostatic Theory. Nine young adult male subjects received glucose intravenously or intragastrically. Arterial, venous, and arterio-venous differences in blood glucose levels showed the elevations expected to occur after such treatments. Consumption of food (in terms of calories, protein, carbohydrate, and fat) during the period of hyperglycemia was not significantly different from control days on which saline treatments were given. Twelve young adult male subjects received glucose treatments as described above. The intensity of appetite (desire for food) as measured by a graded scale of a questionnaire was not significantly altered by the glucose treatments when these were compared with saline-control treatments. The results of these experiments do not support the "glucostatic hypothesis" of Mayer.

JOURNAL OF THE DIETETIC ASSOCIATION, VICTORIA

Vol. 8, June, 1956

* Infant feeding and a few of its problems. E. K. Turner.—p. 1.

Some theoretical and practical aspects of the planning and conduct of tasting tests. E. M. Christie.—6.

Problems of Infant Feeding. It is pointed out that it should be possible for all infants to be breast fed. Failures not to do so are attributed to mismanagement and emotional maladjustment. However, a normal infant can be quite successfully nurtured by varieties of artificial milks, as long as basic principles are understood. A basic requirement is protein. It is required in amounts of 1½ to 2 gm. per pound of expected body weight per day by growing infants. An ounce of cow's milk gives about 1 gm. protein which means an infant requires the equivalent of 1 oz. cow's milk or substitute per pound per day. Regarding fluid requirements, some small inactive infants can take as little as 1½ oz. fluid per pound body weight. Total calories are estimated at approximately 50 per pound expected body weight for the first six months of life and then a gradual fall corresponding to the retardation of growth until only 40 per pound are needed when the child is a year old.

THE JOURNAL OF NUTRITION

Vol 59, May, 1956

* Diet and serum cholesterol in man: lack of effect of dietary cholesterol. A. Keys, J. T. Anderson, O. Mickelsen, S. F. Adelson, and F. Fidanza. —p. 39
* The effect of protein level on the tryptophan requirement of the growing chick. P. Griminger, H. M. Scott, and R. M. Forbes.—p. 67.
* Vitamin B_{12} content of milk and milk products as determined by rat assay. A M. Hartman, L. P. Dryden, and G. H. Riedel.—p. 77.
* Physiological availability of thiamine from potatoes and from brown rice. K. P. Warnick, M. V. Zaehringer, S. V. Bring, and E. Woods.—p. 121.
* The influence of vitamin B_{12} and Aureomycin upon the growth of protein-deficient children. I. F. S. MacKay, S. J. Patrick, D Stafford, and F. S. Cleveland, Jr.—p. 155.

Vol. 59, June, 1956

* The ascorbic acid excretion in the stool in elderly subjects. M. Chieffi and J. E. Kirk.—p. 273.

Cholesterol in Diet and Serum. This is a report of dietary experiments on men under completely controlled conditions, as well as of both cross-sectional and longitudinal studies on men in Minnesota and on two samples of men in Sardinia. The Sardinians lived at home and ate as usual. Variations in the intake of cholesterol over the whole range of natural diets did not influence the serum level of physically normal adult men so long as other elements in the diet are constant. It is thought that this is also probable in the case of women and children. In considering why human serum concentration of cholesterol is so remarkably independent of the amount of cholesterol supplied in the diet, it is noted that a considerable proportion is

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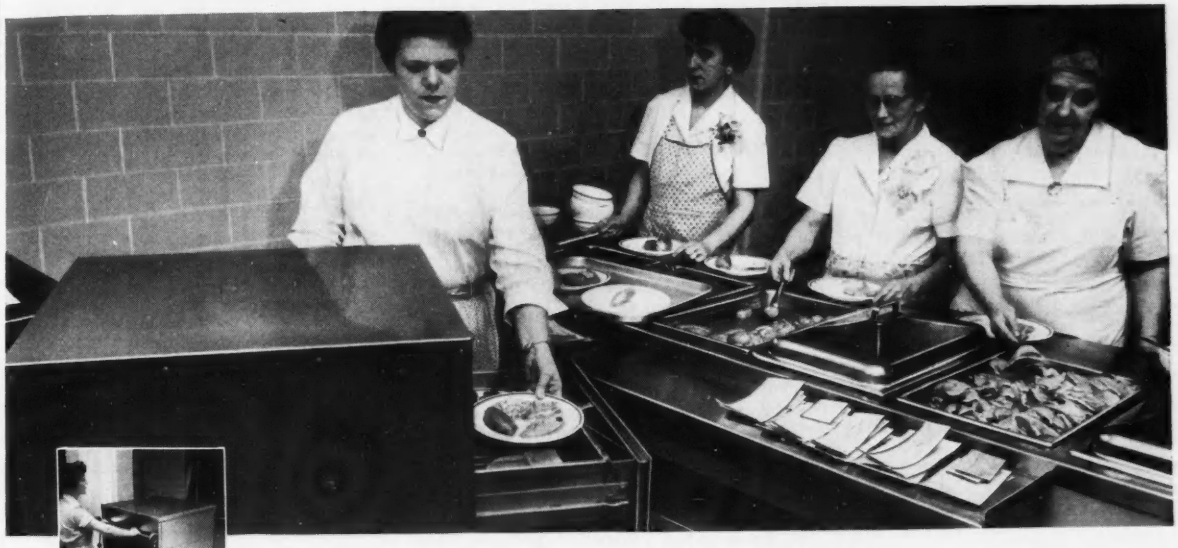

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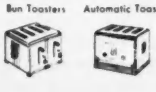

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absorbed from the intestine. More may be provided in the bile poured into the intestine, and it would seem that this endogenous supply, synthesized by the liver, is easily regulated to adjust to the exogenous variations.

Protein Level and Tryptophan. The dietary tryptophan requirement of growing male cross-bred chicks increased with increasing protein levels, though at a slower rate than the latter. When the diet contained 10, 20, 30, or 40 per cent protein, the minimum requirement for tryptophan was estimated to be 0.09, 0.143, 0.182, and 0.20 per cent of the diet respectively. Thus, a protein causing a slight tryptophan deficiency when incorporated into a diet at the 20 per cent level might conceivably supply sufficient tryptophan for optimal growth if provided at a higher level. Supplementation with an antibiotic did not appear to have a sparing effect on the requirement for dietary tryptophan.

Rat Assay of Vitamin B_{12} in Milk. A vitamin B_{12} assay method using growth of the depleted normal rat as the criterion of potency has been described and utilized to assay milk and milk products. Assays were made of milk from Jersey and Holstein cows collected under different conditions of feeding and subjected to different conditions of handling. No differences in potency were observed between the two breeds or between barn-fed and pasture-fed cows. The average vitamin B_{12} content of 10 lots of raw whole milk was found to be 7.1 mcg. per liter. This figure corresponds to the highest values obtained by other workers using microbiologic methods of assay. Neither pasteurization by the holding or flash methods nor storage of raw milk at 0°C. for as much as three days had a significant effect on the B_{12} potency. Values are given for the vitamin B_{12} content of a few samples of several milk products.

Thiamine Availability. Human subjects excreted less thiamine when potatoes furnished approximately one-third of the dietary thiamine than when the same amount was furnished by brown rice, lamb, lamb and potatoes together, or pure thiamine. To determine whether the lower excretion of thiamine during the potato test-periods was due to low availability of the thiamine in potatoes or to increased utilization of the vitamin in the tissues, pig feeding studies were carried out followed by thiamine assays of the animal tissues. Assays of ham, loin, and shoulder cuts indicated that the pigs fed potatoes had a higher concentration of thiamine in the muscle tissues than did pigs fed the rice diet. Thiamine concentration in the heart, liver, and kidney did not vary with the type of diet. The decrease in urinary excretion and the increase in tissue storage of thiamine when potatoes were the important source of this vitamin in the diet suggest that unidentified factors associated with the source of dietary thiamine may influence the utilization and deposition of thiamine in the tissues.

B_{12}, Aureomycin, and Human Growth. This study was made to examine the influence of vitamin B_{12} and Aureomycin on the growth rate in protein-deficient children. Subjects were children in small Jamaican towns. The results suggest a slight positive effect of Aureomycin on weight gain, but no effect on height gain. There was no positive effect observed from the administration of vitamin B_{12}, but it should be emphasized that for the practical purpose of alleviating malnutrition, these results are disappointing and it is unlikely that such factors would be of any practical value in dealing with the problems of growth failure where marginal malnutrition exists. Perhaps more obvious effects would be observed in a population which was more chronically and severely undernourished.

Ascorbic Acid Utilization in the Elderly. Subjects were thirteen men between the ages of sixty-five and ninety years who did not suffer from gastrointestinal disease. An average of 8.2 mg. ascorbic acid was excreted weekly in the stool on a mean ascorbic acid intake of 231 mg. When ascorbic acid intake was increased with 200-mg. daily supplements to 1714 mg. a week, average weekly fecal excretion was 10.3 mg. The average daily fecal excretion of ascorbic acid on the ordinary diet (1.2 mg.) was somewhat lower than reported for young adults. However, supplementation had little effect (1.5 mg. daily).

JOURNAL OF PEDIATRICS

Vol. 49, July, 1956

- A syndrome simulating encephalitis affecting children recovering from malnutrition (kwashiorkor). E. Kahn and H. C. Falcke.—p. 37.
- The treatment of common anemias in infancy and childhood with a cobalt-iron mixture. F. Tevetoglu.—p. 46.

Malnutrition and Syndrome Simulating Encephalitis. Malnutrition is common in South African Bantu children. It is caused by diets consisting mainly or entirely of cereals and lacking milk or other foods of animal origin. The clinical features of infantile malnutrition have been described during the past two decades under such titles as kwashiorkor, infantile pellagra, and malignant malnutrition. Severe cases are characterized by retarded growth, edema, angular stomatitis, cheilosis, and a specific dermatosis. The scalp hair of the Negro child, which is normally black, thick, and curly, turns grayish-brown, thin, and straight, while the skin changes from dark to a light brown. Moderate to severe liver damage usually occurs. This type of nutritional disorder responds well to treatment with diets consisting mainly or exclusively of cow's milk, and most of the deficiency signs disappear in three to four weeks. Eight cases are reported of a neurologic syndrome in children recovering from malnutrition. The syndrome consists of coarse tremors, postural abnormalities, exaggerated tendon reflexes, myoclonus, and a number of less constant components. Recovery usually takes place within a few weeks. It is not known why the syndrome develops in some children but not in others who are recovering from equally severe attacks of malnutrition. Investigations have shown that this syndrome is not related to the portal-systemic encephalopathy seen in association with severe liver damage. The exact pathogenesis of the condition is obscure.

Treating Common Anemias with Cobalt-Iron Mixture. Problems concerned with iron therapy make it somewhat less than satisfactory treatment in children, even in simple iron-deficiency anemia. Iron is of little or no value in anemia associated with infection or chronic disease. Cobalt possesses the property of causing direct stimulation of hemopoiesis and appears to be of clinical value in improving the response to iron in iron-deficiency anemia. The same property makes it possible to carry on aggressive treatment of those anemias due essentially to the hemopoietic depression which accompanies certain common diseases of children. In a general way, children feel better and gain weight during cobalt-iron medication, and such direct treatment of these anemias is recommended both in iron-deficiency and as an adjunct to specific therapy. Anemia associated with geophagia, "nutritional" anemia, anemia associated with infection, and the anemia associated with prematurity and multiple births responded in these patients to cobalt-iron therapy. Cobalt-iron therapy is a useful and safe therapeutic agent for routine use in treating most of the common anemias of infancy and childhood.

THE LANCET

No. 6927, June 2, 1956.

- Parity and the incidence of diabetes. D. A. Pyke. p. 818.

No. 6929, June 16, 1956

- Metabolic studies on two infants with idiopathic hypercalcemia. H. G. Morgan, R. G. Mitchell, J. M. Stowers, and J. Thompson.—p. 925.

No. 6930, June 30, 1956

- Idiopathic hypercalcemia of infancy. Clinical and metabolic studies with special reference to the aetiological role of vitamin D. J. O. Forfar, C. L. Balf, G. M. Maxwell, and S. L. Tompsett. —p. 981.

Parity and Incidence of Diabetes. In an analysis of 955 persons with diabetes, there was an equal sex incidence under the age of forty-five, but a preponderance in women over forty-five. Part of this difference is due to an excess of women in the general population, the rest can be explained by the effect of parity. The excess of women with diabetes was confined to women who have borne children and the incidence rises with increasing parity. Parity does not lead to the earlier appearance of diabetes. This effect of parity cannot be due merely to a greater tendency of multiparae to become fat since the preponderance of women with diabetes is found among those who are normal or underweight.

Idiopathic Hypercalcemia in Infancy Metabolic balance studies of two infants with idiopathic hypercalcemia showed a large absorption of calcium that was probably due to over-action of vitamin D. The plasma calcium level can be reduced by a low-calcium diet without added vitamin D, and more rapidly by also giving cortisone, which increases the proportion of fecal to

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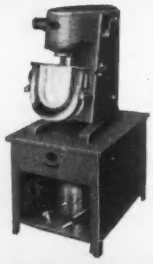

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dietary calcium and phosphorous and may also redistribute calcium in the body. The considerable fortification of many infant foods in the United Kingdom undoubtedly increases the risk of hypervitaminosis D.

Hypercalcemia of Infancy. The study of five cases of idiopathic hypercalcemia is interpreted as showing that although there is evidence of a vitamin D-like effect in idiopathic hypercalcemia, neither excessive ingestion of nor specific hypersensitivity to vitamin D explain all the features. It is suggested that in idiopathic hypercalcemia, a disturbance of cholesterol metabolism produces a cholesterol derivative with hypercalcemic and toxic effects. Perhaps this disturbance of cholesterol metabolism is due to infection. A low-calcium diet induced a negative calcium balance and a lowered serum-calcium level without producing any consistent clinical improvement. Cortisone lowered the serum-calcium level and antagonized the effect of ingested calciferol.

MILITARY MEDICINE

Vol. 119, July, 1956

* Epidemiologic investigation of diarrhea outbreaks. B. D. Holland and O. C. Yens.—p. 11.

Epidemiology of Diarrhea Outbreaks. An effective system using untrained personnel in collecting statistical data to identify the offending item of food in diarrhea outbreaks is described. The system also allows the discoverer to use the best way to correct the sanitary deficiency at fault. It is thought that this system, with modification, would be effective not only in military organizations, but also in institutions, or in reassembling patrons of a banquet, church supper, or restaurant. It is believed this method could be adapted for use in investigations of outbreaks of other food-borne disease.

THE NEW ENGLAND JOURNAL OF MEDICINE

Vol. 254, June 7, 1956

* Fluoridation of water supply. The Norway, Maine, study. A. H. Garcelon.—p. 1072.

Vol. 254, June 28, 1956

* The Shattuck Lecture. Changing concepts and practices in the approach to diseases of the digestive tract. C. M. Jones.—p. 1197.

Fluoridation of Water Supply. Field and laboratory investigations have demonstrated that persons born and raised to about eight years of age on water supplies containing the optimum amount of fluorides experience significantly less dental decay throughout life than those born and raised to the same age on water supplies deficient in fluorides. This study shows that beneficial effects of fluoridated water begin to be apparent thirty months or less after fluoridation is started in the community.

Effect of Smoking on Gastric Secretion. Many clinical opinions concerning the effect of smoking cigarettes on gastric secretions have been offered, but few studies have been sufficiently detailed or adequately controlled to substantiate such opinions scientifically. Two groups of sixty patients each were studied; each patient had duodenal ulcer. One group smoked for a 30-min. period and the other refrained from smoking, acting as "controls." Within the "smoker" group, there were alterations in volume, peptic concentration, or peptic output. However, comparison between the "smokers" and "controls" revealed no significant differences.

NUTRITION REVIEWS

Vol. 14, August 1956

* Amino acid imbalances, toxicities and antagonisms. A. E. Harper.—p. 225.

Amino Acid Imbalances, Toxicities, and Antagonisms. Several of the indispensable amino acids can be toxic when fed at levels of from two to five times the requirement. Some undesirable effects have been observed when relatively small amounts of individual amino acids have been added to inadequate diets. The concept of amino acid imbalance arose from experiments on niacin deficiency when a supplement of a tryptophan-deficient protein, as gelatin, was found to depress the growth rate of rats fed a diet lacking niacin and low in tryptophan. The imbalance was traced to an increase in the level of threonine, valine, or lysine, when each was the second most limiting amino acid for growth. Antagonisms can be differentiated from imbalances, because an amino acid which acts as an antagonist must be provided in amounts that considerably exceed the requirement and the amino acid it fights does not have to be limiting for growth. The demonstration of these effects probably depends more on the relative proportions of the dietary amino acids than on the actual amount of dietary protein. Many questions need answering before amino acids are to be provided to humans in proportions paralleling the need of the animal.

PUBLIC HEALTH REPORTS

Vol. 71, July 1956

* Effect of fluoridated public water supplies on dental caries prevalence. Tenth year of the Grand Rapids-Muskegon study. F. A. Arnold, H. T. Dean, P. Jay, and J. W. Knutson.—p. 652.

Effect of Fluoridated Water on Caries. Observations of the ten-year study at Grand Rapids and Muskegon, Michigan, show that if the fluoride content of the communal water is about 1 p.p.m. fluoride, there is a striking reduction of caries in the deciduous and also the permanent teeth. The caries rate for permanent teeth in children born since fluoridation has been reduced on the average about 60 per cent. No undesirable cosmetic effects have resulted. In addition, benefits were found among persons whose teeth were formed or erupted at the time fluoriation was started.

ROYAL SOCIETY FOR THE PROMOTION OF HEALTH JOURNAL

Vol. 76, July, 1956

* Food hygiene. J. G. Molner.—p. 370.

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Food Hygiene. A review of improvements and advances in handling and technology in regard to food and food preparation is presented. Mention is made that health hygiene programs should incorporate nutritional objectives. Our society has come from an era of regulation and police methods to one of education of the public and the food handler. It is thought that in the final analysis, the quality and safety of the food is determined by the degrees to which the public demands it, by the degree to which the food-handlers believe that such techniques will assure them of better consumer relations, and by the degree to which health department personnel can obtain the full-hearted support of everyone.

SCIENCE

Vol. 124, July 27, 1956

* Flotational lipoproteins extracted from human atherosclerotic aortas. M. Hanig, J. R. Shainoff, and A. D. Lowy, Jr.—p. 176.

Comparison of pinch-caliper and X-ray measurements of skin plus subcutaneous fat. S. M. Garn.—p. 178.

Lipoproteins from Atherosclerotic Aortas. Experiments with rabbits that were force-fed cholesterol have shown a remarkable correlation between atherosclerotic lesions and the S_f 10–30 class of serum lipoproteins. In human serum, any relationships are complicated by diverse, normal classes of lipoproteins, so that interpretation becomes highly statistical. Also, plaques cannot be evaluated because of the inaccessibility of the tissues. In this study, aortas of fresh human necropsies from both sexes were used and findings compared with the degree of atherosclerosis of each extracted aorta, and with the cause of death. Observations indicated almost perfect correlation among plaques, cardiovascular death, and the presence of S_f 12–100 fractions in aortas. The most prominent lipoprotein fraction in serum, S_f 0–12, was almost completely absent in the aorta extracts, regardless of the presence or absence of plaques. The S_f 12–100 was always present in substantial amounts in aortas where there was atherosclerotic activity. It is also usually present in serums in widely varying concentrations. Therefore, its presence in serums may reflect this activity along with other factors. The association of cardiovascular death with the S_f 12–100 fraction from aortas and with the presence of plaques was very strong.

SOUTHERN MEDICAL JOURNAL

Vol. 49, June, 1956

* Practical aspects of formation and prevention of urinary tract calculus. L. D. Atherton and L. Atherton.—p. 611.

Urinary Tract Calculus. Diet can be an important factor in the development of urinary stones, particularly calcium. A high-calcium intake was found in four individuals in a series of two hundred. These individuals had high recurrent incidence of urinary tract calcium stones. It is easier to dilute urinary

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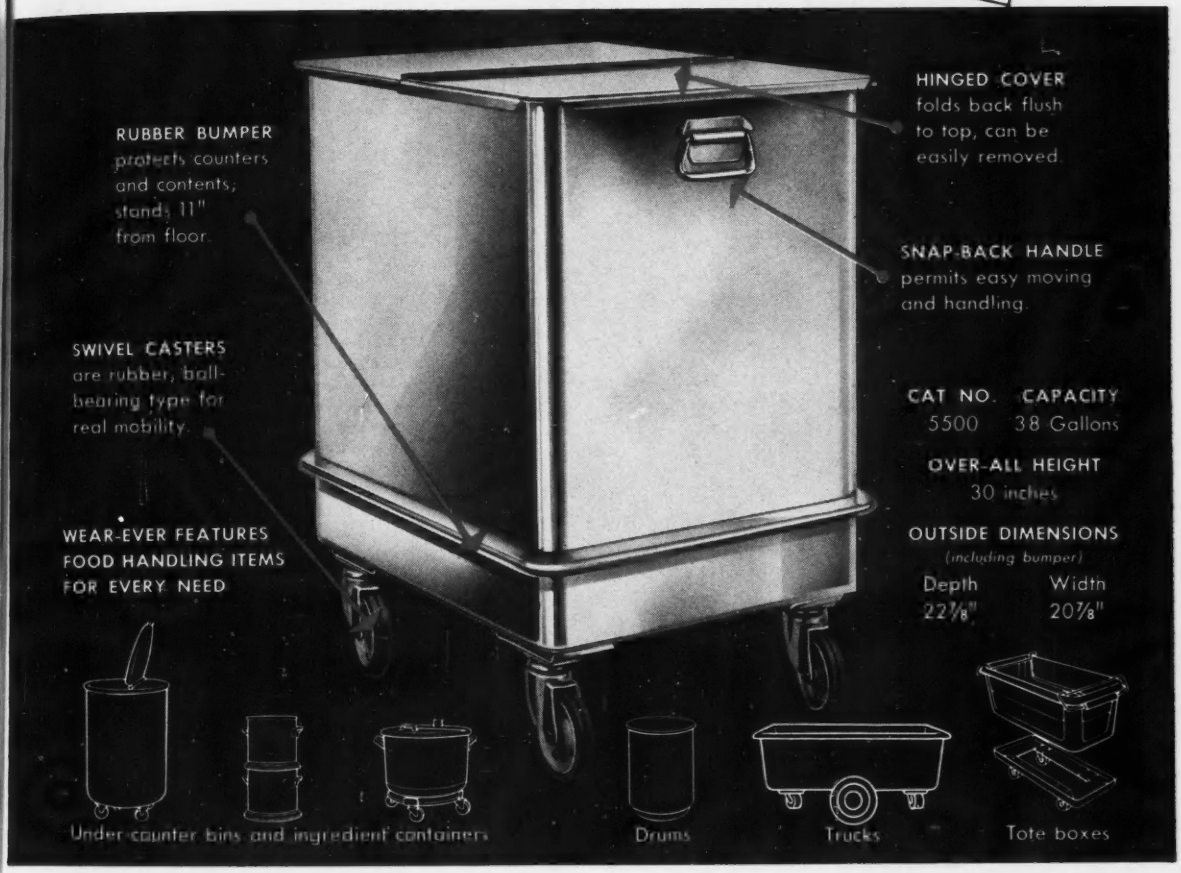

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calcium by restricting dietary calcium than by increasing urinary output. Both, of course, are desirable. In regard to uric acid stones, of all persons interviewed, only one admitted eating enough high-purine foods to make restriction seem anything but foolish. This seems true also of high-oxalate-containing foods in oxalate stone formers.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 21, August, 1956

* What the future may hold for the college kitchen. M. E. Terrell.—p. 48.

Kitchens in the Future. Developments which may be expected by equipment manufacturers to meet demands of quantity food producers are outlined. Suggestions are also made for helping the food manager in planning changes for more efficient operation. In determining whether a piece of machinery will, over a period of time, be cheaper than labor to do the same work, the following questions should be asked: (a) Can time loss and fatigue factors be eliminated? (b) Is there a machine to do a specific unit of work? (c) How does the depreciation rate for a labor-saving machine compare with the labor cost for accomplishment of comparable quality and quantity? The functions of the equipment manufacturer, architect, and dietitian in designing layouts are discussed, and the recommendation made that the dietitian not be expected to do such planning without additional research employees to gather data to be used as the basis for making decisions on remodeling or new construction.

HOSPITAL MANAGEMENT

Vol. 82, August, 1956

* Palatability—a challenge for the dietitian. D. Zumsteg.—p. 86.

Food Palatability. Five rules for achieving palatable hospital food are enumerated. (a) Cook in the smallest quantities practical. (b) Avoid over-cooking. (c) Use mechanical helps, such as thermostats, meat thermometers, timers, and food warmers, to eliminate guess work. (d) Season carefully, making good use of monosodium glutamate and spices. (e) Pay attention to temperatures—serve food at proper temperature. Recipes are given for jellied cottage cheese and vegetable salad and corn timbales or pudding.

HOSPITAL PROGRESS

Vol. 37, August, 1956

* Fair exchange is no robbers (for diabetics). J. Hildebrandt.—p. 91.

Exchange Lists for Diabetic Patients. This article discusses the rationale of the Exchange Lists for use by people with diabetes. The plan furnishes six lists of foods which may be "exchanged" within each list. Any food may be chosen from a given list but *must* be taken in the amount designated. The

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exchange plan is a device to allow diabetic persons more freedom and individuality in the choice of their diets with reasonable control of carbohydrate, protein, and fat intake. Nutritive values of foods vary, depending on location of growth, season, degree of ripeness, variety, and so on; however, there are also variations from day to day in bodily requirements and utilization of food which are even greater than the differences in food composition and which thus minimize the problem of the inevitable variation on nutritive content of food. Thus, by grouping foods in terms of similarity of composition (the six Exchange Lists), reasonable dietary uniformity can be achieved. The Exchange Lists have found wide acceptance by doctors, hospitals, and dietitians, and in medical and dietetic education. Patients, too, are finding this a system which is easy and reasonable to use.

HOSPITALS

Vol. 30, July 16, 1956

* How to keep pots and pans clean. D. F. Williamson.—p. 62.

Vol. 30, August 1, 1956

* Double duty dietitian.—p. 37.
* How to write a standardized recipe. L. M. Sullivan.—p. 61.

Vol. 29, August 16, 1956

* What's new in modified diets. A. L. Molleson.—p. 68.

Cleaning Pots and Pans. Five causes of dirty pots and pans include: inadequate number of compartments in the pot and pan sink; inadequate lighting and ventilation; inadequate hot water supply; poor quality and improper use of detergent; and poorly trained or untrained employees. Ten steps, with detailed "how to do it" instructions, for efficient economical pot and pan washing are given. (1) Prepare, soak, and rinse compartments. (2) Sort pans by size. (3) Scrape pots and pans. (4) Soak pots and pans. (5) Scrub pots and pans. (6) Rinse and sanitize pots and pans. (7) Remove pots and pans from sink. (8) Store pots and pans. (9) Change water. (10) Clean pot and pan station.

Double-Duty Dietitian. Two days in the life of a shared dietitian who works in two hospitals 31 mi. apart are disclosed in an effective picture-story with captions which explain her duties in the two institutions. After two years, this dietitian "still loves the variety that is offered by heading the dietary departments in two hospitals and revels in a feeling of accomplishment."

Writing Standardized Recipe. In approaching the problem of recipe standardization, it is well to evaluate the recipes that are on hand in terms of their distinctiveness, good flavor, ease of preparation, and cost. It is wise to weed out recipes which are unused, out of date, or unsatisfactory. Then set a recipe goal and begin standardizing. In the evolution of a small quantity recipe to a large one, it is best to increase the recipe gradually. Double it the first time and compare it with the original small quantity recipe. If the result is satisfactory, then double the recipe again. Generally, when the product is standardized on a fifty-portion basis, it can be satisfactorily increased with relatively little change. When a high quality product has been achieved, it is important that the recipe be written to insure this quality day to day. The most usable form for quantity recipes in the hospital kitchen is the 4 by 6 in. card. Each person responsible for preparing a product should have a file of recipes at his work center for his own use so that he does not have to spend time looking for them. A master file in a steel filing case in the head dietitian's office will provide a complete file of recipes. As a guide for actual recipe-writing, the author lists ten important points to keep in mind in listing ingredients, and fourteen points to be observed in writing directions for combining ingredients.

Trends in Modified Diets. New knowledge of nutrition may lead us to regard nutrients in terms of the total organism and to consider the interrelationship of these nutrients in preserving health. The time may be approaching when we will deal with specific amino acids and trace elements, and when the ratios of various nutrients will become important in diet therapy. Nutrients currently receiving considerable attention are protein, cholesterol and fat, and sodium. In surgery, colitis, and ulcers, protein intake is important. Dietary sodium becomes of importance in congestive heart failure and hypertension, and the low-cholesterol, low-fat diet for prevention and treatment of atheroscle-

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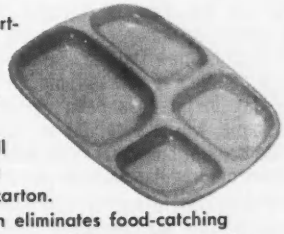

New LUNCHAMP compartmented tray-plate is ideal for hot lunches. Four deep well sections hold the *entire meal* easily, safely — one well is shaped for carrying a soup bowl, cup or milk carton. Over-all rounded-design eliminates food-catching corners — assures cleaner washing, easier stacking.

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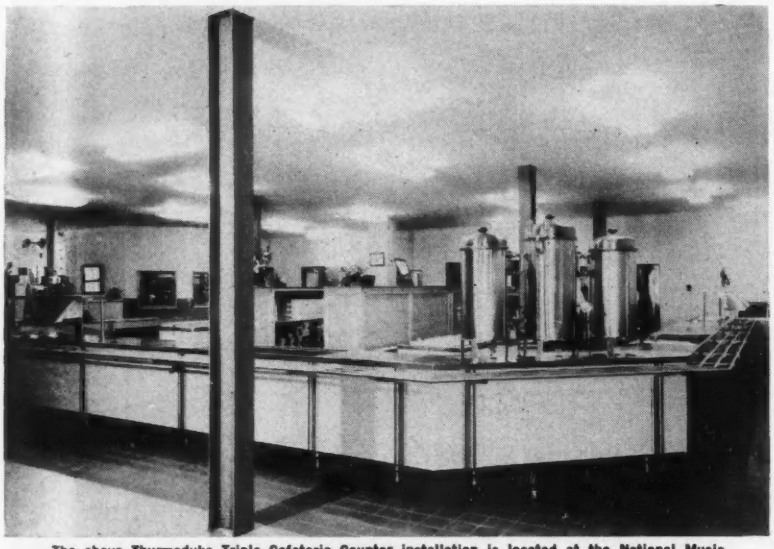
rosis is receiving much attention. Weight reduction and weight control have brought to the forefront various methods of restricting calories. In reaching an understanding with the medical staff on prescription of modified diets, the dietitian will find seminars for medical and dietary staffs helpful, as are diet manuals. Education of the patient is also of importance if diet therapy is to be effective, and the dietitian must recognize the emotional strains caused by restricted diets. A dietitian should visit a patient as soon as possible after admission to obtain a diet history, invaluable in planning a realistic diet for both hospital and home. Selective menus are also a means of helping to ease the patient's tension.

INPLANT FOOD MANAGEMENT

Vol. 3, August, 1956

* Management SEES new solution to inplant food service.—p. 40.

Blind Cafeteria Managers. The Philadelphia branch of the Pennsylvania Association for the Blind is providing employment for blind persons as cafeteria managers in its program of operating cafeterias in industrial plants on a contract basis. Under this plan, the manager of the operation is a person whose visual acuity is within the definition of blindness, that is, he has lost 80 per cent or more of his sight. If he has some sight, he might do the cashiering as well as management, provided he can see the contents of the tray without difficulty. The PAB provides intensified training for the would-be manager which may last from two weeks to three months or longer. When it is felt that the trainee is capable of handling the business alone, he is installed as manager, but from time to time receives management counsel from the PAB. Only those with personalities and abilities compatible with business and relationships with people are selected. The visually handicapped manager usually assists in preparing menus, making work schedules, and purchasing and ordering merchandise and supplies from vendors selected by the supervisor. Every blind person who is sponsored by the agency is required to use the vision of the sighted personnel in all matters requiring visual inspection in the preparation and serving of food. The blind person is taught to perform mechanical parts of the job in which lack of sight is not a detriment. For example, the blind person may be taught to peel vegetables, but he will be watched by a sighted employee. The blind person does not prepare or serve any foods but such a person can serve package goods, such as bottled drinks, candy bars, and wrapped sandwiches. This work was first begun in Canada, where today more than five hundred food units are operated by the Canadian National Institute for the Blind. A number of other agencies offer similar services in the U.S. These are listed.



The above Thurmaduke Triple Cafeteria Counter installation is located at the National Music Camp, Interlochen, Mich. This world famous educational institution for talented young people occupies more than 300 buildings located on a woodland campus of over 700 acres, bordering on two beautiful lakes. Approximately 1900 students are enrolled each year.

"Everyone is pleased with our delicious food, speedy service"

Mr. J. Wendell Turner, Director of Food Service at the famous National Music Camp, writes he has received many compliments on his new Thurmaduke counters. He says, "Service is now so rapid, virtually all waiting in line has been eliminated. For example, we have served as many as 1,565 persons at one meal in considerably less than our regular serving hour.

Work is done with less effort and everyone is pleased with the delicious food and speedy service. It has also been a great source of personal satisfaction to me to have this modern installation rated by the local health authorities as among the finest in the area, from the standpoint of functional beauty and sanitation."

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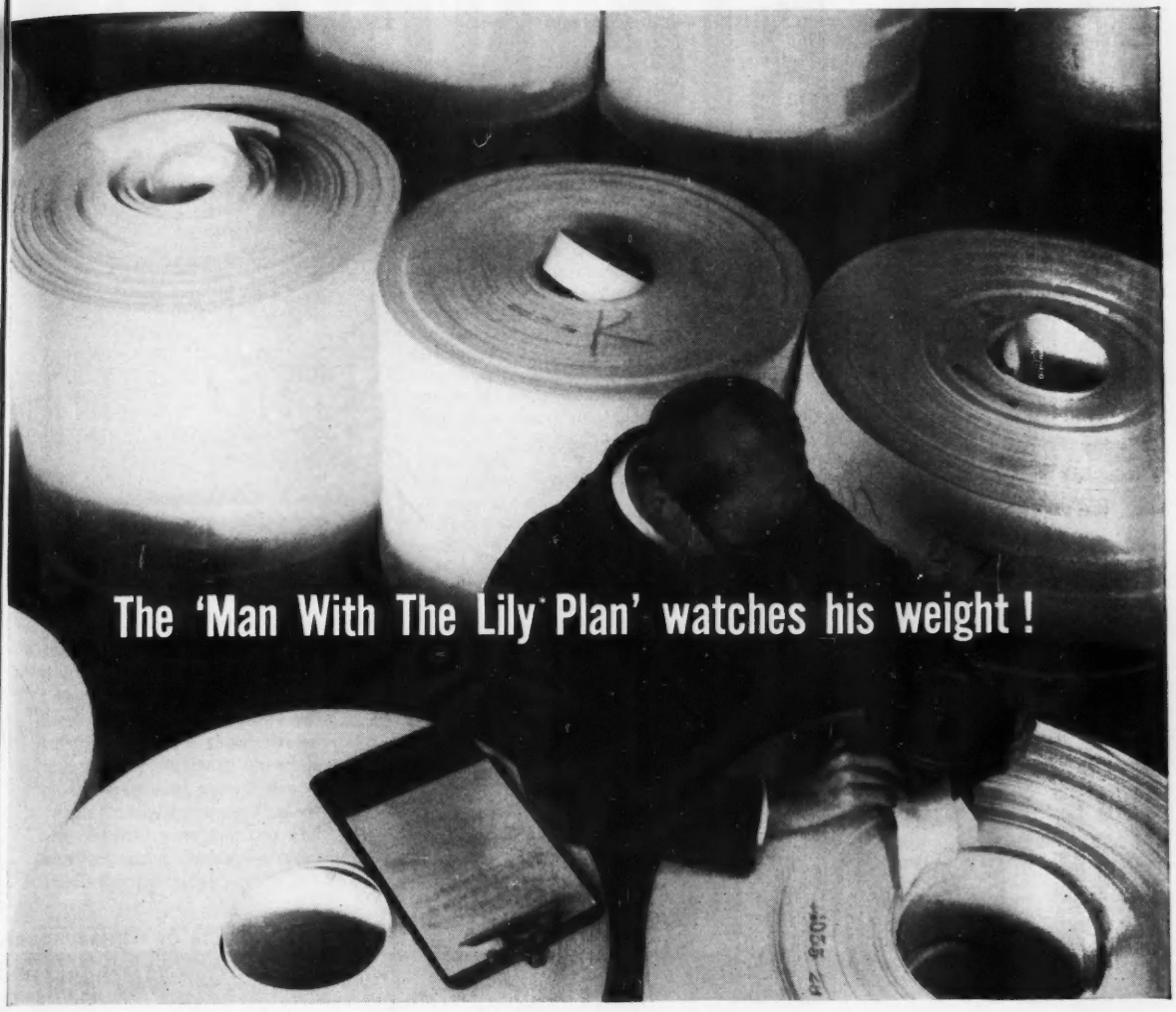
INSTITUTIONAL FEEDING AND HOUSING

Vol. 7, August, 1956

* Simplify your sandwich production.—p. 32.
* Detarnishing silverplate.—p. 36.
* How to choose the right floor.—p. 38.
* Spice seasoning is an art. R. Audelan.—p. 46.
* Establish a maintenance program. L. H. Kotschevar.—p. 62.

Simplifying Sandwich Production. Three sandwich-making methods to serve as guides for employees are outlined: a single sandwich made "to order"; multiple-stack method for thirty sandwiches; and assembly-line method for large quantity production. Variations on these methods can be developed to meet specific requirements. "Sandwich season" ideas include recipes for deviled tongue filling; peanut cheese crunch filling; almond-bacon cheese filling; Mambo cheese filling; hot tuna surprise rolls; and American blue cheese frankfurter sandwiches.

Detarnishing Silverplate. Fill a clean, 2- to 3-gal. aluminum container about two-thirds full of very hot water. Add two to three handfuls of ordinary table salt. Place stained silver in the container and allow it to remain until stains disappear (about ½ to 1½ min.). For big pieces, the bath should be made in a larger container with a less expensive salt. A silver detarnishing basket with aluminum plates attached to the bottom is available. The silver is placed in the basket and immersed in the bath in any type of container. After repeated detarnishing, silver becomes etched to a light gray and loses some of its luster. To restore the finish, the silver should be burnished.



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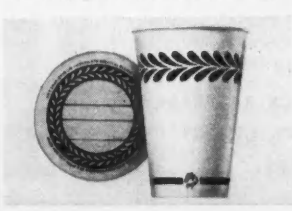

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RASPBERRY PIE

1½ pounds Black Raspberry Jell-O
2¼ quarts hot water (140°-160° F.)
2½ quarts frozen raspberries, thawed
6 baked 9-inch pie shells, cooled
3 cups heavy cream

1. Dissolve Jell-O in hot water. Sweeten berries, if desired. Add to Jell-O. Chill.

2. When slightly thickened, pour 2 cups of mixture into each shell. Chill.

3. Whip cream. Fold in rest of Jell-O. Pour over firm Jell-O; chill until firm. *Yield:* Makes 6 quarts filling.

GF INSTITUTIONAL PRODUCTS DIVISION
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Resilient Flooring. Resilient flooring provides an almost endless variety of decor possibilities, and there is a type for every purpose and budget. Although not generally recommended for kitchens, resilient floorings are used in almost every other room of the food service operation. There are eight main types: asphalt tile, rubber tile, linoleum, linoleum tile, cork tile, vinyl-plastic tile and sheet, and vinyl-asbestos tile. The author discusses and presents a table which shows characteristics of these eight types of material as to: comfort underfoot; quietness; cleanability; maintenance; slipperiness with grease or wax; and resistance to abrasion, dents, grease, alkali cleaners, and color change. Approximate material cost plus installation cost of resilient floors per square foot when laid over concrete is shown for all types. Sizes and thicknesses available in the various types of flooring material are also given.

Spice Seasoning. There are three secrets behind every good French chef. They are: butter, shallots, and the pepper mill—in other words, skillful seasoning. Just as the pepper mill is the secret of fresh pepper flavor, the proper blending of spices is the key to success in these aromatic plant flavorings. There are almost endless combinations of herbs and spices which will improve the various kinds of meats. The chef who wishes to attain distinction must be willing to experiment. The best way to arrive at the proper strength of seasoning is to start with a moderate amount of spice and add more until the desired flavor is achieved. In meats which are to be cooked a long time, it is best to season when the meat is nearly done. In this way, the seasoning will not have disappeared by the time the meat is served. For the steak that is to be broiled only a few minutes, herbs are added to the butter in which the meat is basted. This rule is altered only when you are using whole spices, such as peppercorns, bay leaves, mustard seeds, and roots of ginger. Fowl is frequently improved by the use of a pungent spice, such as the warm, Hungarian form of paprika. Stronger flavored meats are toned down or rounded out by the proper use of such herbs as basil, thyme, savory, or marjoram. Moderation is important in the use of all these spices and the chef should "shade," like the artists, so that the flavor of no one herb or spice will dominate a dish. Recipes for Hungarian goulash, sauerbraten, lamb curry, and beef and pork loaf are given.

Establishing a Maintenance Program. In setting up a cleaning program, write a set of instructions for each piece of equipment in the kitchen; list the cleaning materials required; enumerate cleaning procedures; detail any special instructions; provide a checklist for checking efficiency of the cleaning operation; set up a time schedule for cleaning equipment; and specify, by name, the person responsible for each job. For any usable program for proper equipment operation, a manual of instruction is necessary. The following elements should be included in each set of instructions: (a) each step, in order; (b) directions to report possible malfunctions immediately; (c) remedies for breakdowns or simple repairs that may be made during operation; and (d) in-use lubrication or cleaning procedures. Periodic checks of equipment provide warnings and regular schedules of adjustment and replacement help avoid excessive wear and expensive repair. Set up a written schedule to include: (a) servicing to be performed, listing the equipment; (b) who is to do it; (c) how it is to be done; and (d) how frequently such servicing is to be performed. If maintenance and repairs are to be handled by a maintenance department, complete information, manuals, and instructions for repair must be provided. The most commonly needed spare parts should be stocked or on hand at the dealer's. Lists of spare parts for each piece of equipment should be filed with the maintenance manuals, showing catalog number, manufacturer's description, serial and model number of the machine, and possibly size. When a servicing contract is set up with an outside organization, a schedule of service visits is needed. It is desirable that a record be kept, showing work performed; conditions found; operating condition of the equipment as checked out by the service man; suggestions to management on recommended procedures, repair, or replacement; and results from operation of the equipment after servicing.

INSTITUTIONS

Vol. 39. August, 1956

- Steam for cleaning. A. Macfarlane.—p. 7.
- Here's pattern for popular menus. S. M. Hartt.—p. 34.
- Keep fruits and vegetables nature-fresh.—p. 75.
- Hints on buying melons.—p. 77.
- How to keep refrigerators trouble-free.—p. 79.
- Train from top down, not from bottom up. M. Mitchell.—p. 123.
- Vertical travel solves 5-floor food service problems. (Pt. 2)—p. 142.

Steam Cleaning Equipment. The author covers steam cleaning guns, boilers, and automatic steam traps in this fourth installment of a series depicting the role played by steam in cooking operations. Pictures and diagrams disclose the mechanics of the cleaning process and to accompany the text, the author has outlined steps in the operation of hooking up hoses to steam lines and mixing control unit, preparation of detergent, operation of the gun, and operation of mixing valves. The installation of steam boilers, plotting steam requirements, how to figure steam load and its relation to size of boiler, and steam traps used to speed the cooking process are fully discussed.

Pattern for Popular Menus. Some menu planners, in addition to recipes and current price files, use a check-list reminder form on which the names of possible menu items are arranged under general headings. Such a list, used for menu planning by students at Purdue University, Lafayette, Indiana, is shown. A "cycle menu" plan helps to avoid frequent repetition and is especially useful in determining the amount of each menu item to prepare. This system also provides a means of determining the

popularity of menu items. Included are cycle menus which were used in the Michigan State University Union, East Lansing, on the first two Mondays of the spring 1955 cycle. The author discusses another convenient tool in menu making, the price card. With this system only the ingredients in a recipe which have changed in price need to be refigured to keep the record up to date.

Antioxidant for Fresh Fruits and Vegetables. An antioxidant dip delays oxidation for considerable periods of time so that advance preparation of salads, fruit desserts, and French fries is possible. To keep green salads at appealing crispness, whole or sliced vegetables such as celery, cabbage, lettuce, or spinach are immersed in the antioxidant solution for 30 seconds, drained thoroughly, then stored dry in the refrigerator. Fruits, such as apples, bananas, peaches, pears, pineapple, and avocados, if they are to be used sliced, should be sliced immediately, placed in a strainer, then dipped in solution for 30 seconds. Remove strainer of fruit and drain thoroughly, then place in the refrigerator. If there is delay between peeling fruit and slicing it, dip whole peeled fruit for 30 seconds, drain, and then dip again after slicing.

Buying Melons. Ripeness in almost all kinds of melons is indicated by the softening of the part of the fruit which surrounds the "eye" or "button" at the blossom end, and which yields to pressure of the finger. Usually the odor becomes more perceptible when the full stage of ripeness is reached. Sometimes a change of color to a more or less yellowish tinge is also a sign of ripeness. Specifically, a Casaba melon of good quality has a soft, creamy white, sweet, and juicy flesh, but without aroma. Ripeness is usually indicated by a yellow color of the rind and a softening at the blossom end. The Cranshaw is a new melon of exceptional quality which matures late in the fall and is usually ripened off the vines. A Cranshaw of good quality has a soft, juicy, thick, and bright salmon-colored flesh with a rich aroma. Ripeness is indicated by a further yellowing of the rind and a softening of the tissue, especially at the blossom end. The honey ball is somewhat like the honeydew but smaller. Prime-quality honey ball melons have a thick green-colored, sweet, fine-flavored flesh with a distinct, fine aroma. The rind has a light-yellowish color and yields slightly to pressure. Frequently these melons have dark sunken spots; such melons generally have fine flavor if the spots have not penetrated the rind. The honeydew melon has a whitish green rind changing to creamy white when ripe. Usually the area around the small scar or button at the blossom end yields to slight pressure when ripe. Ripeness may also be indicated by a slight pleasant odor. The flesh of a full-ripe honeydew is greenish, very juicy, sweet, and of fine-grained and melting texture. The Santa Claus or Christmas melon is one of the latest and best keepers of the winter melons. When of good quality, it has a thick, sweet, firm, juicy, light yellowish-green flesh, and a fine aroma. Ripeness is indicated by a slight yellowing of the rind and a softening at the blossom end.

Trouble-Free Refrigeration. Five steps for trouble-free refrigeration throughout the summer, as suggested by the Air Force Services Division, are: (a) Be sure the interior surfaces of the refrigerating unit are clean and as free as possible from accumulated ice and snow, as ice on the coils acts as an insulator. A fraction of an inch of ice may cut down the efficiency of a refrigerator from 30 to 55 per cent. The same thing holds true for freezers. It may be desirable to defrost units more frequently than usual. (b) Check motors to see if they are running for excessively long periods, although during the summer months, the motors will run more. Installers should be able to give an approximate idea of what percentage of time the motor should run. (c) Be sure that radiators, screens, and cooling coils are kept clean to assure free and easy passage of air. (d) Be sure exhaust and intake areas of refrigerating units are clean and not cluttered by boxes, crates, rags, and so on. For efficient operation, it is absolutely necessary that refrigerated units have an ample supply of air and adequate ventilation. Units must not be boxed in tightly or circulation cut off. (e) Make a real attempt to keep the surrounding area free from dirt and dust that might clog the radiator or the coils.

Train from Top Down. Top management must understand the principles of good training and actively support a

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High protein, low fat diet	Sustagen, 580 Gm.	2250	137	385	20	contains all amino acids in well balanced amounts
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training program which would reach from the top down through every level of the organization. Training is a planned method of teaching habits and skills to people. The old-fashioned apprenticeship method of learning is long outdated, as is the trial-and-error method of training. Training is necessary to develop skillful workers who can produce quality products in the most efficient manner, and to develop an atmosphere of cooperation and pleasantness. Before discussing a training program (scheduled for a later issue), several thoughts about training should be discounted: (a) belief that just giving instructions is training; (b) belief that training is "school stuff" for kids only; (c) belief that a "pep" talk or scolding is training; (d) belief that "learning it the hard way" is the best way; (e) belief that reading a booklet or manual is training; (f) belief that training is just "theory" and not practical; (g) belief that training on the job should include "rough going" and trial and error procedures; and (h) belief that training should all be done by a separate department or school.

Vertical Travel Solves Food Service Problems. In a previous issue the author discussed vertical travel as a space-saver when food service facilities are located on several floors. This installment analyzes the eighth floor kitchen of a well known private club in Houston, Texas, with the help of a half-page diagram showing layout, including station positions and equipment.

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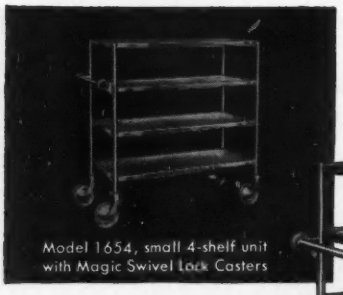

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Casters	*8" double ball bearing	*8" double ball bearing

*Customer is offered choice of 2—8" swivel and 2—8" stationary casters or 4 swivel casters with one caster at each end equipped with magic swivel lock. Either choice at no extra charge. Bumper handles and continuous rubber bumpers supplied at slight extra cost.

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MODERN HOSPITAL

Vol. 87, August, 1956

* A middle manager must look both ways. W. A. Taylor.—p. 85.
* Salads should be treated with respect. J. M. Rock and D. H. Zumsteg.—p. 112.

Middle Management. There are four fundamental things which the supervisor must do if he is to become a true middle manager who fully discharges his obligations to management. He must: (a) thoroughly learn the over-all administrative philosophy, the hospitalwide objectives, and general problems of the hospital as they exist in the minds of his administrator and governing board; (b) interpret conditions and problems of his department to management as they relate to the perspective of management; (c) communicate—upward and downward; and (d) never cease to be a representative of management. The wise administrator and board of trustees will explain themselves as fully as possible to department heads and other representatives of middle management. The middle manager, for his part, must listen and read carefully and thoughtfully. The middle manager must participate in the policy-making process if middle management and top management are to live and work in harmony. By interpreting departmental conditions and problems to management, the supervisor reveals much that is vital in the interest of good management of the hospital. He is concerned with the tactics of administration—that is, control of day-to-day operations "on the firing line" so that the objectives of his department are achieved. An enlightened administrator must also welcome the participation of middle management in policy formulation in other ways. Extensive experience in his technical field makes it possible for the supervisor to furnish intelligent data for evaluating the durability of policy in the revealing glare of operating realities. The middle manager also is able to predict and identify trends which bear on top management's planning. Helpful suggestions and new ideas from the middle manager will fall on eager ears if the administrator to whom they are directed is a thoughtful strategist. And, if middle management is to operate as the extension of top level direction, it, in turn, must be kept informed by higher echelons of management. Continuous, accurate, downward communication throughout the chain of supervising command is necessary.

Treat Salads with Respect. Main dish salads usually get the same careful attention that is accorded hot main courses but accompaniment salads are a different story; they are likely to be lost in the shuffle. Where a choice of accompaniment salad is offered, one green salad and one fruit, vegetable, fish, or combination salad is usually a satisfactory menu pattern. The salads should be planned in relation to the entire meal—not as individual courses, but they should definitely add character to the meal. The right sort and size of accompaniment salads (they should be more or less medium size) can cut down the required portion size of the main

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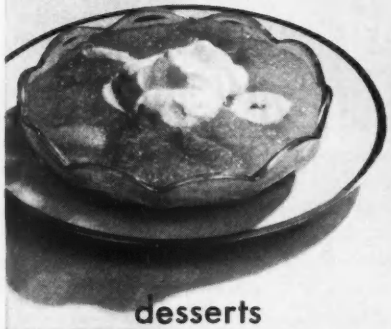

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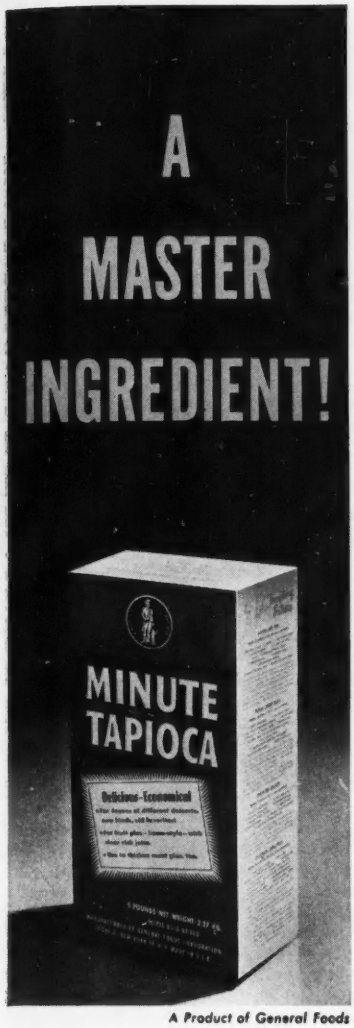

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dish, also. Mayonnaise and French dressing will be standard in any salad department for use "as is" and varied to suit the individual situation. Home-size bottles of specialized dressings are sometimes the answer to perfect salad dressing without excessive expense or cumbersome inventory. Recipes are given for two accompaniment salads and salad dressings—frozen fruit salad, hot potato salad, tomato French dressing, and Florida low-calorie French dressing. A check list pertaining to all salads is also included, and many, many salad suggestions.

PERSONNEL JOURNAL

Vol. 35, July-August, 1956

* Your informal organization: dealing with it successfully. J. D. Stanley.—p. 91.

Informal Organization. Informal organization is that network of personal and social relations which is not specified by formal organization. It is based on the authority which stems from the personal acceptance of individuals by one another. This "informal authority" cannot be delegated. Because the informal organization has its own distinct culture, informal group values and goals may differ from those of the formal organization, creating a serious dilution of loyalty to the firm. Four principles or "guides to action" follow. (a) Principle of uniqueness—a particular informal organization bears some general similarity to other informal organizations, but in detail it is unique and local and must be studied and analyzed in the situation in which it exists. Thus, no single research procedure can be used universally to analyze informal group influence. (b) Principle of resistance—an informal organization will resist any threat to its cultural integrity, and the members of an informal organization react as a group rather than as single individuals. Awareness of this group reaction enables managers to anticipate possible resistance and to form policies which will minimize interference with the firm's operations. (c) Principle of degree of control—an informal organization will exert a degree of personal control over its members which is not attainable by the formal business organization. Managers cannot, in their formal office, exert either the amount or the type of personal control over subordinates or superiors that may be exercised by an informal organization over its members. Thus, unless counteracted, this informal control may challenge formal control and disrupt the formal organization. (d) Principle of integration of objectives—the objectives of the informal organization are an essential part of its cultural heritage. To insure their integration with the objectives of the firm, managers must plan and develop a program for integration, including effective two-way communication as a major element. A manager must take purposive action to insure harmony between his firm and the informal groups within it, since it is unlikely that such harmony will occur spontaneously. A check list is included to judge the nature and influence of these informal organizations and to evaluate the effectiveness of a program for coordination within the formal organization.

RESTAURANT MANAGEMENT

Vol. 79, July, 1956

* Kitchen cues. A. and G. Eiss.—p. 34.
* 70 ideas for sandwiches. A. Easton.—p. 48.
* Storage and step-saving ideas. N. Kirikos.—p. 62.

Vol. 79, August, 1956

* Make it easy for the new waitress. E. Fair.—p. 41.
* Layout for efficient fuel supply. N. Kirikos.—p. 42.
* How to care for uniforms.—p. 46.

Meat Handling. Beef is a dark bluish-red when it is fresh, turning a brighter red on exposure to air. The inside of the cut will retain its dark color, however. For steaks and roasts it is desirable to have a layer of outside fat and a marbling of the fat with the lean, while a leaner cut is suitable for ground beef. Meat becomes more tender when it is stored, but it may develop a "gamey" flavor if stored more than forty-five days. There are several meat tenderizers on the market which do a satisfactory job. Freezing also increases tenderness of moderately tender cuts but does not noticeably affect very tender or very tough meat. One advantage of freezing after the meat has been cut into portions is that you can serve a piece at a time and will have no losses from storage. Installation of ultra-violet ray lamps in the cooler reduces the growth of bacteria and mold and makes it possible to operate the cooler at a higher temperature, thus speeding up enzyme action which produces tenderness in beef. It also cuts down waste from excessive trimmings. The flavor of the tougher cuts can be brought out by using a thick iron kettle and cooking slowly over a long period of time. Rapid boiling simply wastes fuel and results in poor flavor. Meat cooked by dry heat usually has more flavor than stewed or boiled meat. Roasting should be done at 250 to 300°F. to avoid shrinkage. Pork is not improved with ageing and should not be stored for any length of time. If it is frozen and stored at 0°F., it may be kept for several weeks without loss of flavor. Fish spoils more readily and should be stored directly on ice.

Seventy Sandwiches. Seventy ideas for sandwiches for every taste and time of day are presented, as well as merchandizing suggestions. Recipes are included for a pastromi, cheese, and tomato combination; deluxe turkey sandwich; sandwich loaves; and pinwheel sandwiches. The author shows nine ways to cut sandwiches and nineteen ways of arranging them, and lists approximate yields of some common fillings and sandwich supplies.

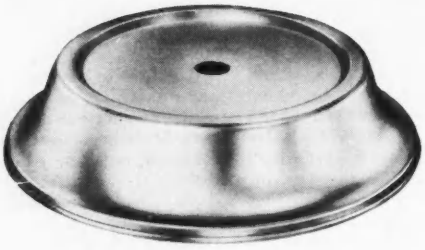
Storage and Step-Saving. The author uses specific examples to show that storage and step-saving are two of the most important items in a kitchen today. Shelves are placed over every piece of equipment which is a starting

point for food. Refrigerator doors are hinged to suit the situation. The space at the back of the refrigerator is equipped with shelving from floor to top. At the hot food section and sandwich unit, the top shelf of the warming cabinet extends 6-in. over these units to provide more space for finished plates and less reaching distance; the units underneath are protected, too. The waitresses' pick-up shelf is high enough over the hot food tables to clear the meat-pan roll cover; shelving behind refrigerators is open and shelving in front of the hot food tables has sliding doors with electric strip-heaters mounted on the lower shelf and under the top shelf. The section of the sandwich unit has sliding doors but is not heated.

Helping a New Waitress. The fear of doing something wrong is present in almost every new waitress. Allowance for this must be made not only by the restaurant operator but by every person on the staff. She is also uncertain of her position. Part of her first day's indoctrination should therefore make her position on the staff clear. All restaurant routines should be given to the new waitress in either verbal or written form, preferably the latter. Relaxing job pressures during the early period when the new girl is first employed has also been found to be good procedure. It is a good idea to exempt a new waitress from bonus plans, contests, and similar incentive drives for the first month or so. In this way she has an opportunity to build self-confidence. Let her know that performance records are not expected of her during her early weeks on the job and that initial reverses on her part are expected. New waitresses should never be put on the job "all alone" for the first day or two. A policy of overlooking first mistakes and/or correcting them more in the form of explanation than reprimand forms a good impression with the waitress. "Pats on the back" also mean more to her during the first week than at any other time. Her opportunity for advancement should also be made clear during the first days on the job as well as during the job interview. Whenever possible, introduce her to the regular customer. In doing so you also indirectly inform the customer that you consider him a good enough friend to introduce him personally to the newest member of your staff.

Efficient Fuel Supply Layout. A sufficient supply of gas for your equipment during peak loads is important to cooking efficiency and may lower your fuel bill. Four fuel layouts are shown. Plan "A" shows two ranges with a single gas connection at one end. In Plan "B" there are two ranges and one broiler. The arrangement can be changed, but fuel consumption stays the same; two gas connections, one at each end assure the broiler of enough gas when all three units are in full use. Plan "C" shows the addition of a spreader plate. In this case, gas is brought in from the back and tied into the manifold at the front of the ranges. When this is done, the gas does not have to feed one range first and then filter to the other; both ranges receive equal portions of gas. In larger installations, Plan "D" is used; one, two, or three spreader sections are used through which are brought gas connections. The author suggests that an easy way to check equipment is to get the B.T.U. rating of each unit from an equipment dealer and add up the consumption needed. Then ask the gas company to check the incoming gas and the gas feed line into your building. Many times the latter is too small and the equipment does not receive enough fuel when the cooking load is high.

Uniform Care. In preventing unnecessary uniform expense, several points are important: (a) wisdom in purchasing—quality materials, strong construction, roomy cut, and proper fit are a few of the attributes of a desirable uniform; and (b) care in using—a word of precaution to employees will insure their cooperation in taking proper care of their uniforms. The results will be well worth while, not only in decreased expenditure for uniforms but in employee morale, resulting from the knowledge that their uniforms still look attractive. Specific suggestions for the care of pockets, buttons, buttonholes, belt and waistline wear, sleeve and underarm seams are given. If quality uniforms, carefully purchased, are used, and proper care is given to them after purchase, the results will be well worth while, not only in decreased uniform expense, but also in employees' morale, resulting from the knowledge that their uniforms are attractive and that they make a good appearance.



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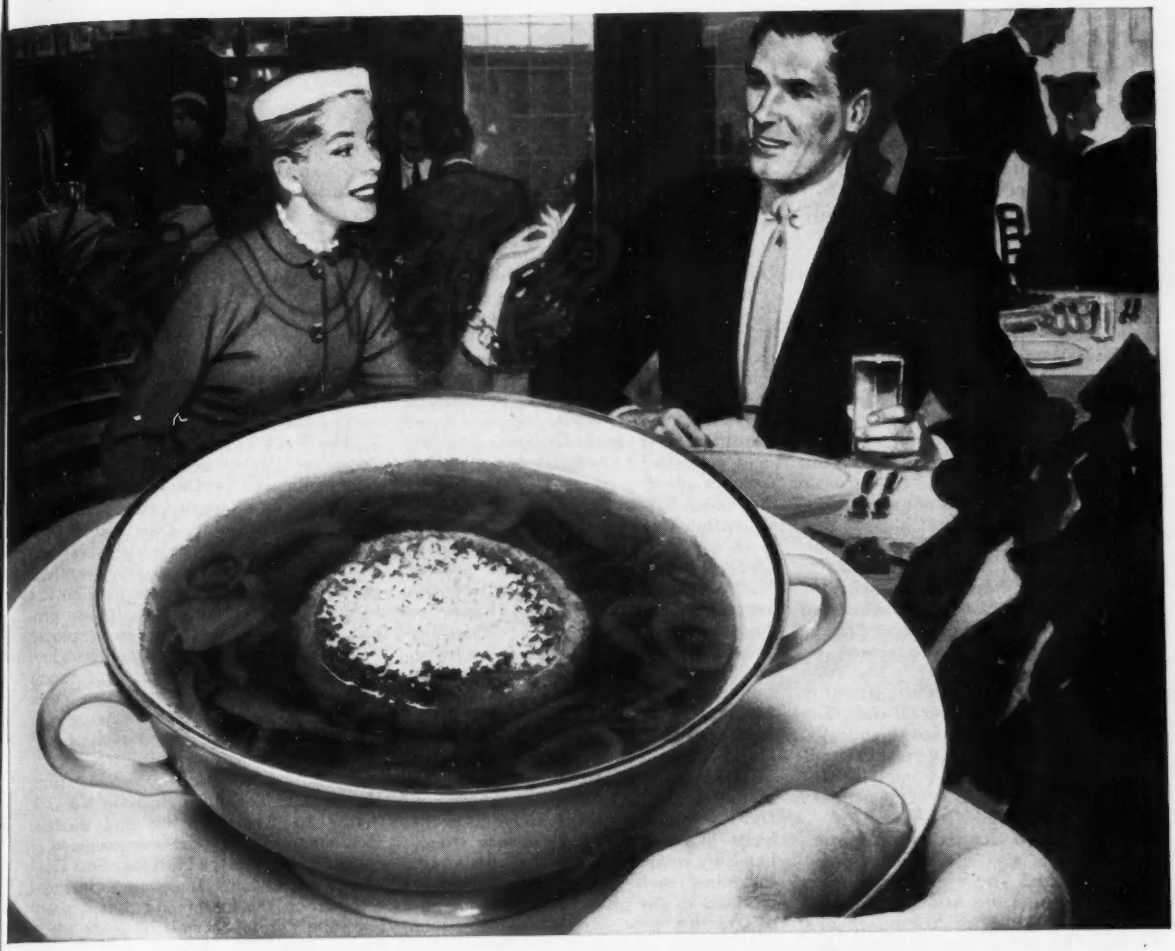

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News Notes

Symposium. On November 9, the Nutrition Foundation, Inc., and the Southern California Section of the Institute of Food Technologists will hold a symposium on "Nutritives in Food and Food in Nutrition." The morning session will be devoted to a discussion of analytical problems of interest to nutritionists, while in the afternoon the latest developments in nutrition will be considered. The symposium will be open to all food processors and scientists. Meetings will be held at the Huntington Sheraton Hotel, Pasadena.

American Committee on Maternal Welfare. Announcement has been made of the dates of the 1957 Congress on Maternal Care to be held in Chicago: they will be July 8 through 12. This Congress, sponsored by the American Committee on Maternal Welfare, will be dedicated to the theme, "Complete Maternal Care." The previous six Congresses have been called "American Congresses on Obstetrics and Gynecology"; the name has been changed to indicate attention to the entire field of maternal care. The program will be divided into three major parts: "What Is Complete Maternal Care?" "Who Provides Complete Maternal Care?" and "How Is Complete Maternal Care Given?"

The American Committee on Maternal Welfare is also sponsoring a joint committee with representatives from thirteen national organizations, including A.D.A., which is formulating a "Guide to Maternity Care in Hospitals." A content outline of the "Guide" has been completed, and revisions and additions will be made at later committee meetings.

Plentiful Foods — MONTHLY LIST

The following foods are expected to be in plentiful supply in October:

Protein foods

Beef
Chickens—broilers and fryers
Cheese
Eggs
Milk and other dairy products
Turkeys

Other foods

Cabbage
Peanut butter
Rice

WHO/FAO Reports. The report on the "Joint FAO/WHO Conference on Food Additives" held September 19 to 22, 1955 in Geneva, Switzerland, has recently been released. The report outlines the advantages of international action with regard to food additives, pointing out that: (a) the potential health hazards from the inadequately controlled use of food additives are world wide, (b) exchange of information and experience on as wide a basis as possible would be of value, and (c) the size of the problem makes it impossible for any one country to undertake the investigations needed. It is noted that the question of food additives has implications for international trade as well as for health. Specific lines of international action are suggested, including the collection and dissemination of information on food additives encompassing information on relevant legislation in different countries. Food colors, preservatives (antimicrobial agents and antioxidants), and emulsifiers are singled out as deserving priority. This report is WHO Technical Report Series No. 107 and FAO Nutrition Meetings Report Series No. 11.

A second WHO report is "Food Hygiene," which is the Fourth Report of the Expert Committee on Environmental Sanitation. In it, the Committee has undertaken the task of formulating general principles of food hygiene which can be adapted to national needs by public health authorities in all countries. Many foods may be the vehicle of disease, and the report discusses in some detail the control of the most important, i.e., milk and milk products; meat; fish, including shellfish; and vegetables and fruits commonly eaten raw. The problems of maintaining sanitary food-handling procedures are then reviewed, including such subjects as improper methods in the production of food; unsatisfactory processing procedures; and the dangers of storing, delivering, and displaying food without adequate precautions. Consideration is also given to the important food-hygiene problems presented by commercial and communal feeding. The report then turns to the planning of food-hygiene programmes and to the technical and administrative procedures for improving conditions. The first step, it is recommended, should be the development of a trained field staff, followed by the complementary services. The report also considers personnel requirements and outlines the training of health inspectors, on whom the bulk of the work in promoting food hygiene will fall. This report carries the number: WHO Tech. Rep. Ser., No. 104.

Both reports sell for 30 cents a copy and may be obtained from the International Documents Service, Columbia University Press, 2960 Broadway, New York 27.

Research Reports Listed. "A List of Published and Processed Reports, October, 1954–55," has been compiled by the Agricultural Research Service, U.S.D.A., and released as ARS—23–4. In it, research reports on foods, human nutrition, and home economics at the land-grant institutions of the U. S. have been listed both according to state and subject matter. Areas covered include: food composition and nutritive value; food preparation and utilization; food processing; food quality; home and institutional management; nutrition and diet.

National Restaurant Association Publications. Number 12 in the National Restaurant Association's Supervisory Review Series, "Together We Stand," is now available. It is primarily a summary of the preceding eleven booklets in the series, and stresses the need for constant follow-up in successful restaurant supervision.

The NRA has also announced that a series of twelve four-page leaflets is being prepared by the Educational Department for use by restaurant managers in employee training. They will be written from the employee's viewpoint and will deal with problems that confront people as they serve the public. The series will cover four large topics: providing answers to common employee complaints, increasing an employee's loyalty and pride toward "his" restaurant and industry, building employee incentives for increased job performance; and increasing employees' awareness of, and respect for, the restaurant customer.

A third publication of interest from the NRA is Technical Bulletin No. 500, "How to Avoid Insect and Rodent Problems." This report was prepared in cooperation with the National Pest Control Association, Inc., and includes sections on the insect and rodent problem, the different types of pests which menace the food industry (with illustrations for identification purposes), and insect control. Specific measures for control of the various types of pests are detailed, and a table on comparative life cycle characteristics of some insects has been compiled.

Appointment at Michigan State. Announcement has been made of the appointment of Dena C. Cederquist, Ph.D., as Head, Department of Foods and Nutrition, Michigan State University. Dr. Cederquist, who succeeds Dr. Margaret A. Ohlson, has been a staff member at MSU for twelve years. She holds B.S. and M.S. degrees from Iowa State College, and a doctorate from the University of Wisconsin. Before coming to Michigan State, she was Instructor in Foods and Nutrition, Kansas State College and the University of Wisconsin.

New U.S.D.A. Poultry Regulations. In July, the Poultry Division, Agricultural Marketing Service, U.S. D.A., issued a revision of the federal poultry regulations. Included is a new standard applicable to frozen poultry pies. According to the new regulation, a minimum content of 15 per cent cooked boned meat will be required in poultry pies processed under the Department's voluntary inspection program. This requirement should have a stabilizing

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PRESIDENT

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A check of our restaurant operations all over the country revealed that only 27.5 per cent of the glasses now in use are at least a year old -- in other words, we are serving our patrons with practically new sparkling glasses.

The average tumbler use is 739 servings -- at an amazingly low cost of 8.8 cents per 1,000. Libbey Glassware provides the fine service we like to give our patrons.

Sincerely yours,

J. Willard Marriott

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President of the
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For seven years a code symbol on the bottom of every Libbey Heat-Treated glass has made it possible to trace this revolutionary ware in almost every type of use.

Mr. J. Willard Marriott, President of the Hot Shoppes, Inc., chain of Washington, D. C., and Past President of the National Restaurant Association, is convinced of the economy of Libbey Heat-Treated DATED Glassware . . . as are restaurant operators throughout the country. You can prove to *yourself* the economy of the world's first DATED Glassware . . . prove that Heat-Treating and the Libbey guarantee: "A new glass if the rim of a Libbey 'Safedge' ever chips" provide the finest glassware service at the lowest cost per serving.

Your Libbey Supply dealer has complete details. See him or write Libbey Glass, Division of Owens-Illinois, Toledo 1, Ohio.

At left is the attractive interior of one of the new Hot Shoppes restaurants using Libbey Heat-Treated DATED Glassware. To check your own glasses just look at the Heat-Treated mark on the bottom of each tumbler. Numbers indicate date of manufacture—left shows year and right shows quarter. Add up the number of servings to see the amazing economy of Libbey Heat-Treated DATED glasses.

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effect on the quality of most brands of these pies, since about 80 per cent of the production moving into interstate commerce is prepared under the Department's program.

The new regulations also define Rock Cornish Game Hen (or "Cornish game hen"—either name is accepted) as usually meaning: "a young, immature chicken (usually 5 to 8 weeks of age) weighing not more than 2 pounds ready-to-cook weight, which was prepared from a Cornish chicken or a Cornish chicken crossed with other breeds of chickens."

Night Courses in Institution Management. At the University of Chicago this year three courses in institution management will be given at night. Each can apply toward a Master of Business Administration in the School of Business. The courses to be offered are: Problems in Management of Quantity Food Production, Institution Organization and Management, and Institution Food Management Seminar.

Food Consumption. First data from the U.S.D.A.'s 1955 survey of spending for food by 6000 families have been released. Figures show that family food expenditures increased about 25 per cent per household between 1948 and 1955, while retail food prices rose only 6½ per cent. Factors to explain these rises are listed as: increase in the average size of families; 38 per cent increase in income per capita after taxes; and purchasing of more expensive foods, including those with "built-in" conveniences, such as prepackaging and precooking.

The average family food bill (3.43 persons) for the nation was $27 a week in the spring of 1955, with food consumed at home costing $22, while meals and food eaten away from home accounted for $5. These figures do not include the cost of soft drinks and alcoholic and other beverages, but do include many non-food items, such as soap and paper goods, commonly bought in groceries. Average expense per person was $7.89 for all food—$6.50 at home ant $1.39 away from home.

In contrast, in 1942, the average family food expenditure was $10! A more precise comparsion can be made for urban families of two or more persons who were surveyed in 1942, 1948, and 1955. In 1942, the average food budget was $13 a week; in 1948, $26, just twice as much; and in 1955, $32.

Some regional differences were found last year. In the Northeast, food expense was $31 a week; in the North Central region, $28; in the West, $30; and in the South, $22. Differences between urban and rural families were also apparent. City dwellers of all sizes averaged $30 a week for food, while rural families spent only a little more than half that amount, $17, largely due to home-produced foods.

By income, the data show that urban families with incomes under $2000 had food bills averaging $18 a week, compared with $34 for those with $5000 to $6000 incomes.

One-member "families" were also included in the 1955 survey. Average food expense was $10 a week; of this total $8.50 went for food at home and $1.50 away from home.

Interns Graduate. The twenty-fifth class of dietetic interns at the Henry Ford Hospital, Detroit, graduated on July 26. Members of the class and their guests were honored at a dinner, followed by presentation of the traditional cap, diploma, and pin to each intern by Margaret King, Director of Dietetics. The graduates are:

Ruth Brown, University of Manitoba
Patricia Culver, Macdonald Institute
Carolyn Head, Macdonald Institute
Verta Clark MacDonald, Michigan State University
Gloria Nogueras, University of Puerto Rico
Dolores Spiegoski, Michigan State University
Glenda Stelson, Michigan State University
Shirley Young, University of Manitoba

Army Personnel Announcements.

APPOINTMENT AND ACTIVE DUTY

Capt. Hazel A. Teague

CHANGES IN RANK

Major to Lieutenant Colonel

Helen M. Davis

1st Lieutenant to Captain

Mary M. Charlesworth
Helen R. Stafford

BRITTANY JR. HIGH SCHOOL, University City, Mo.
Mrs. Muriel B. Hallowell, Dir., School Cafeterias Architect—Wm. B. Ittner, Inc.

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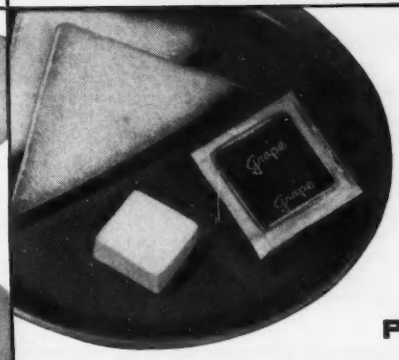

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Available in ½-oz. size in 6 popular varieties: grape jelly, apple jelly, orange marmalade, strawberry jam, currant jelly, cranberry sauce.

Take advantage of Kraft PC Packs if you want to serve finest-quality jams, jellies, table syrup, ketchup and mustard profitably . . . without waste or bother.

Convenient—No work involved with PC's—all you do is place them on the plate. Always neat, sanitary and attractive too.

Measured Costs—No labor costs or waste of employees' time. You can always tell how many servings you have on hand. Costs can be measured to the penny.

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Packed for Easy Handling—PC jams, jellies, ketchup, mustard packed 20 to a tray . . . 10 trays to carton; PC syrup 20 to a tray . . . 5 trays to carton. Stores in minimum space.

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Frances J. Tatum

Revert to Major, Regular Army
Hilda M. Lovett

REGULAR ARMY APPOINTMENT
1st Lt. Mary L. Fisk

SEPARATIONS

Reserve Officers Relieved from Active Duty
Capt. Mary K. Connelly
Capt. Judith Judd
Capt. Georgiana Pearson
1st Lt. Eileen R. Clark
1st Lt. Mary H. Coles
1st Lt. Elinor G. Marshall
1st Lt. Patricia L. Pankau
1st Lt. Janet R. Rogers

Association Activities

1956–57 Officers. Appointments to A.D.A. Boards and Committees are made annually except for those described otherwise in the Association's Constitution. On the Officers' Page of this issue appear the names of the newly elected officers and Board and Committee appointees. A complete listing of Boards, Committees, and A.D.A. representatives has appeared for the last two years in the February issue of the JOURNAL and will again be published in February 1957.

Names of the 1956–57 state presidents, with addresses, are also given on the Officers' Page.

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All-Welded Construction
Only Blodgett welds frame and walls into a single unit for longer, more trouble-free life.

Thicker Insulation!
Only Blodgett has full 4" insulation for lower fuel costs, cooler kitchens, evener cooking heat.

Counterbalanced Doors
Sturdier, yet they open with just a flip of the fingers.

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Separate, extra-exact controls give you precisely correct cooking heat in each separate oven compartment.

Get twice the oven capacity in the same floor space . . .

Cook, bake and roast simultaneously . . . prepare 70% of your menu in one place! It's easy to see how *vertical* ovens slash your costs. You get more dining area, more compact kitchens, save time-wasting steps for your cooks. There's less stooping. Kitchens are cooler, too. Choose from 24 models in 7 finishes . . . call your Kitchen Equipment Dealer now for all the facts!

Illustrated above: #959. Capacity six Roast Pans, thirty-six 10" Pies, six 18"x26" Bun Pans. All-stainless finish shown; available in 6 other finishes.

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A.D.A.'s New Affiliation with World Health Organization. The American Dietetic Association has just become a sponsoring organization of the National Citizens Committee for the World Health Organization. The purpose of this Committee is to publicize the relationship between public health and world peace; to increase appreciation of the importance of international programs for improving public health; and to stimulate discussion and understanding of the aims, functions, and purposes of the World Health Organization and related international organizations. This Committee cooperates with the American Association for the United Nations, the Foreign Policy Association, the National Commission for UNESCO, the U. S. Committee for UNICEF, and the National Conference on Food and Agriculture Organization.

Marguerite J. Queneau, Associate Nutritionist, Division of Medical Services, New York State Department of Health, Albany, has been appointed A.D.A. representative on the Policy Committee of the NCC for the WHO.

A.D.A. Organization Charts. Two charts on A.D.A. are now available. One pictures the structural organization of the Association; the other graphically displays duties and responsibilities of various parts of the Association. These are available at a cost of 10 cents a copy from the Headquarters office. They will also be published in the November issue of the JOURNAL.

Staff Change. Announcement is made of the appointment of Leonard D. Smith as Business Manager of the Association to succeed J. Hart Rosdail, who resigned in September following five years of service with A.D.A. Mr. Smith is a graduate of DePaul University, Chicago, having majored in management, with minor subjects of economics, finance, and accounting. His previous work experience has included teaching in Chicago at the St. Rita High School (English and bookkeeping) as well as adult education work at the Carl Schurz High School. He has also been employed by the Chicago Park District, where he supervised budget transactions, and by Armour and Company, where he assisted with audits of Armour outlets. Mr. Smith is a member of the Society for the Advancement of Management and the American Legion. He is married and makes his home in Chicago.

New A.D.A. Booklets. "The Story of the Dietitian in the United States" and "A Glimpse of The American Dietetic Association" are available from Headquarters office at a cost of 25 cents each. These booklets were previewed in this column in the July issue of the JOURNAL.

"The Story of the Dietitian in the United States" may well serve to acquaint hospital administrators, as well as members of allied organizations and other community groups, with our profession. This is the first leaflet of its kind to be issued by the Association.

TIG takes the sting out of hand washing!

New—from Diversey
a revolutionary liquid cleaner
that's gentle to hands,
safe on equipment

Red, raw hands are no joke to the people who do your hand washing jobs. You can bet they'll be grateful when you switch to TIG, Diversey's revolutionary new *liquid* cleaner. TIG's extraordinary cleaning power does *not* depend on any of the harsh, skin-punishing ingredients commonly used in other compounds. TIG is neutral . . . harmless as plain water, not only to hands but to your costly equipment. TIG's fast, powerful action makes short work of the toughest jobs . . . penetrates hard-caked grease, crusted bake-ons, stubborn stains . . . floats all the soil away. TIG saves money, too. One compact 10 gallon drum of liquid TIG out-lasts and out-performs a bulky 325 lb. barrel of granular compound. Ask your Diversey D-Man for a demonstration. Or for more facts, write The Diversey Corporation, 1820 Roscoe Street, Chicago 13, Illinois.

DIVERSEY

AHEA Appointment. Corrine H. Robinson has been appointed to serve as a member of the International Committee of the American Home Economics Association. This committee is concerned with the international scholarship awards which AHEA presents annually. The organization has indicated that it frequently has applicants who are in this country to take advanced study in the areas of dietetics, community or public health nutrition, institution management, and research in nutrition.

Visitors from Abroad. The Association is interested in maintaining a record of dietitians from abroad who are working or observing our hospitals in this country. If any are located in your hospital, it would be appreciated if you will notify the Association.

A.D.A. Exhibits. The Association presented the exhibit, "Achieve Your Proper Weight" at the 58th Annual Convention of the *American Hospital Association* which met September 17 through 20 in Chicago. Beverly Schmidt, Chief Dietitian, Children's Memorial Hospital, Chicago, was booth chairman. Working with Mrs. Schmidt were members of the Chicago Dietetic Association from Billings Hospital, Chicago Wesley Memorial Hospital, Little Company of Mary Hospital, Presbyterian Hospital, St. Luke's Hospital, Michael Reese Hospital, Grant Hospital, Swedish Covenant Hospital, and Children's Memorial Hospital.

In addition to our own Annual Meeting this month, the Association will be busy with presentations at three allied organizations' meetings. The *American Dental Association* held its meeting October 1 through 4 in Atlantic City. Sister Maude Behrman of the New Jersey Dietetic Association was chairman of our exhibit, "Nutrition and Dental Health." She was assisted by members of the New Jersey and New York groups.

The *Chicago Health Fair*, sponsored by the Chicago Junior Association of Commerce and Industry and The Chicago Medical Society, is being held October 13 through 21 in the new Prudential Building. Members of the Illinois Dietetic Association will "man" the booth which will consist of the "Achieve Your Proper Weight" exhibit. Featured at the exhibit will be "The Best of Health to You" and the recently developed and very popular leaflet "Step Lively . . . and Lose Weight." A large attendance was anticipated since the Health Fair will be open to the general public.

The Tenth Anniversary Convention of the *American School Food Service Association* will also be held in Chicago, October 22 through 25. Katherine Vatz, Weiss Memorial Hospital, and members of the Chicago Dietetic Association will represent the Association with an exhibit pertaining to diets for children.

Next month, members on the Eastern seaboard will again be asked to represent the A.D.A. at the *American Public Health Association* meeting in Atlantic City, November 12 through 16. From the exhibit, "Eating Is Fun," the leaflet, "Forget Birthdays . . . Enjoy Good Eating," will be distributed.

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Universal dishwashers pay their own way with these cost-saving, better washing features. Different sized models with Swing-Wash, revolving wash or pressure equalized wash • Complete coverage revolving final rinse • Built-in Final Rinse Water Booster heaters, steam, gas or electric operated for required 180° final rinse • Better sterilization — Faster drying • Automatic timed wash and rinse control units.
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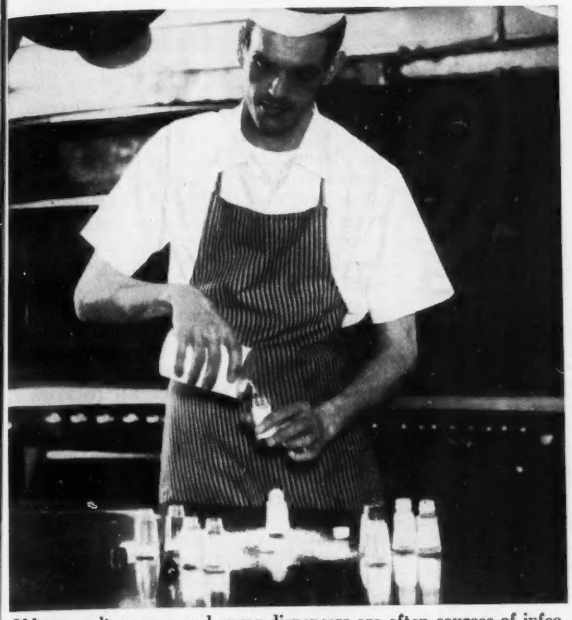
Obituaries

Elmira Blecha. It was with sadness that all of Elmira Blecha's friends heard of her death at the Veterans Administration Hospital, Houston, on August 24. She had been an active, enthusiastic worker in the dietetic profession since the days of her internship. At the time of her death she was Chairman of the Diet Therapy Section of The American Dietetic Association. She had also held various offices in both the Michigan and Texas Dietetic Associations, and had served on the A.D.A. Internship Board and the JOURNAL Board. She has been the author of a number of articles in this JOURNAL and in other professional publications.

Elmira held dietetic positions in Lima, Ohio; the University of Michigan as Research Nutritionist, Clinic Dietitian, Assistant Director of Dietetics, and Instructor in Dietetics in the Department of Medicine; Massachusetts General Hospital as Clinic Dietitian; and for the past four years as Instructor in Dietetics at the Veterans Administration Hospital, Houston.

She was an inspiration to the many staff members and dietetic interns she came to know in her various positions. She was an outstanding teacher with the

How Diamond Crystal seasoning packets end danger of cross-infection from dispensers



Old-type salt, pepper and sugar dispensers are often sources of infection. Require constant washing, sterilizing and servicing. Require storage space for both themselves and bulk seasonings.

Diamond Crystal packets are individual seasoning containers. They are disposable and sanitary. Need no servicing. And your patients appreciate their modern convenience.

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Old-fashioned seasoning dispensers can be an expensive problem to hospitals. They get dirty quickly. Shakers and bowls need constant cleaning. Re-filling. Sterilizing.

Considering the price of labor today, servicing several thousand shakers can really run up your operating costs.

Packets solve problem

Diamond Crystal seasoning packets are disposable. Hygienic. Eliminate dangers of cross-infection from dispensers.

Each packet contains a generous serving of either pure Diamond Crystal salt; spicy ground black pepper; or fine granulated sugar. When the patient finishes his meal, the packets are thrown away.

There is never the danger of broken glass dispensers when you serve packets.

Exclusive "shaker" action

Only Diamond Crystal packets let you *shake on* seasoning. Their sturdy fluted paper construction allows the same *method* of application as old-type dispensers—without the costly need of regular washing, filling and sterilizing. Your saving on dispenser servicing alone more than makes up for the slight additional cost of packets.

Exclusive "Shaker action" of Diamond Crystal packets allows controlled application of seasoning.

Send for free samples

See for yourself how Diamond Crystal packets can save you time and money. Just mail the coupon below. You will receive a free sample box of 100 Diamond Crystal salt, pepper and sugar packets for your own use by return mail.

Mail this coupon for free samples

Dept. JA
Diamond Crystal Salt Co.
St. Clair, Michigan

Please send me a free sample box of your seasoning packets.

Name_____

Position_____

Hospital_____

Address_____

City_____ **State**_____

ability to stimulate intellectual curiosity. She always had time to help her students and fellow workers to understand a problem but was wise in directing them to solve it for themselves.

Those who knew Elmira well will always remember the merry twinkle in her eyes, her quiet little chuckle, and her knack of putting a great deal of wisdom into a few words. She was always a student—reading, comparing, evaluating the literature relating to dietetics and nutrition.

In addition to her varied professional interests, she lived a full and active personal life. She loved entertaining friends, a good game of bridge, swimming and bowling, and perhaps best of all, driving her car. She visited her family and friends in Michigan in August and was planning to see her many friends in Milwaukee in October.—*Mable M. MacLachlan, Sault Ste. Marie, Michigan.*

John W. Hargrave. It is with deep regret that the JOURNAL publishes the announcement of the death in August of John W. Hargrave, architect, as the aftermath of an automobile accident which occurred a month earlier. Mr. Hargrave was well known to dietitians and will be remembered with fondness for the stimulation and help which he gave as the leader of a series of conferences on layout and equipment at two successive A.D.A. Annual Meetings—in 1954 in Philadelphia and in 1955 in St. Louis. Some of his knowledge of the problems in this area has also been published in the JOURNAL. His appearances at our Annual Meeting proved so popular that he had been invited (and had accepted) to participate again in our convention program in Milwaukee. The dietetic profession lost a real friend in John W. Hargrave.

"By George! He must have been thinking about another cup of rich-tasting Continental Coffee!"

Everyone Enjoys

More Coffee Flavor

In every walk of life everyone enjoys rich, full-bodied, invigorating CONTINENTAL COFFEE. Superb blending of the world's choicest coffees and precise roasting with automatic controls assure unfailing uniformity. Write today for a FREE trial package.

Continental Coffee

AMERICA'S LEADING COFFEE for Restaurants, Hotels and Institutions

CHICAGO • BROOKLYN • TOLEDO

In the Pacific Northwest it's

ROYAL CORONA COFFEE

Seattle, Washington

News of Products and Services

A helpful and well-written booklet by *Crane Company* discusses planning and supervising of restaurant washrooms. A method to determine the number and type of fixtures needed is outlined and an example of a well-planned restroom installation presented. A list of equipment needs for proper maintenance and a section on cleaning schedules are included.

Borden's Instant Starlac has a newly-designed package which features the "Heart of Milk" theme. All packages have a protective, plastic-coated, foil lining to keep out moisture and insure the product keeping almost indefinitely on a cool, dry pantry shelf. Once liquefied, Instant Starlac should be stored in the refrigerator. The manufacturer is offering as a box-top premium, a plastic pitcher for mixing, storing, and serving the liquefied product. Instant Starlac comes in three sizes: the family-size, economy package makes 12 qt. nonfat milk at a cost of 7 cents a quart; a 1-lb. package makes 5 qt; and a pre-measured package contains three individual envelopes, each making 1 qt. nonfat milk.

Announcement has been made by the Borden Food Products Company, Division of *The Borden Company*, that it will build a Research and Development Center at Syracuse, New York. Operations are scheduled to begin in 1957. All activities involved in getting a product from the idea stage to the consumer will be coordinated in the Center, including studies of packaging, flavor evaluation, and consumer marketing research. The Center will consist of a laboratory and pilot plant; a usual feature of the latter will be the installation of commercial-size equipment in addition to scaled-down equipment. A full-time staff of forty-five to fifty people will be employed by the Center.

The Coffee Brewing Institute, Inc. has reprinted from *Food Technology* a study on "Organic Acids in Brewed Coffee." Using partition chromatography, the organic acids of five extracts were determined. The predominant acid was found to be chlorogenic, and the least in evidence was acetic acid. Caffeic, pyruvic, oxalic, malic, citric, and tartaric acids were present. The study concludes that the role of chlorogenic acid in the flavor of coffee warrants further investigation.

A combination of five top cooking units plus a "sealed-heat" oven base highlights *Hotpoint's* new "SUPERchief" heavy-duty range. Each of the five top cooking units maintains any of three available heats. Fitted flush with the nickel-plated steel top at rear corners and in the center are three round hot

CONTROL YOUR FOOD COSTS...

ROUND CASSEROLE

SERVE UNIFORM PORTIONS *in*

HALL
Secret Process
FIREPROOF CHINA
AVAILABLE IN 26 BEAUTIFUL COLORS

Hall Casseroles make portion control automatic. The capacity of the dish guarantees a uniform serving to each guest . . . you can determine costs and set menu prices with accuracy. Recipes served in Hall China look and taste better. . . and can be sold at better prices. Write for Bulletin SM-1.

THE HALL CHINA COMPANY • EAST LIVERPOOL, OHIO
The World's Largest Manufacturer of Fireproof Cooking China

ALSO AVAILABLE!
HALL CHINA METAL-CLAD...by PLATECRAFT®
Secret Process HALL CHINA plated with lustrous nickel-chrome by a secret process.
Write for Bulletin MC-65

OVAL FISH CASSEROLE
OVAL CASSEROLE—HANDLED
NEW YORK CASSEROLE
INDIVIDUAL STEW POT—HANDLED

H-6

★ SEE OUR EXHIBIT—SPACE 2212—NATIONAL HOTEL EXPOSITION—NEW YORK COLISEUM—NOVEMBER 12-16 ★

plates. Two Calrod (R) units at the front corners with quickly removable reflector pans heat instantly and respond quickly to changes in switch positions, for quick, short order work. The "sealed-heat" oven features a temperature range of 200° to 500°F., with top and bottom heating elements independently controlled. It is an all-purpose oven, usable for any baking or roasting operation. The "SUPERchief" is produced in standard 36-in. width, with over-all dimensions which match those of Hotpoint's "SUPERange Automatic" and the new "SUPERgrid Griddle-Top."

Metropolitan Life Insurance Company has prepared a new weight-control display, "The Secret of Balance," which may be used along with a leaflet with the same title to emphasize the importance of balancing energy intake with energy output. The display consists of two panels in color with easel backs, each measuring 27½ in. wide by 22 in. high. This is one of the health education materials prepared by Metropolitan to stimulate interest in good nutrition. This exhibit, as well as other materials on nutrition, is available from the Health and Welfare Division of the company. Metropolitan exhibits are loaned without cost, and transportation is paid both ways.

National Canners Association has released 1955 statistics on canned foods in the form of inserts which may be used to replace 1954 data in the Association's reference book, *The ABC's of Canned Foods*. Along with the new statistical pages, text pages for eight new chapters to be added to the book have also been distributed.

A second edition of "Citrus Fruits in Health and Disease," published for the medical profession by the *Florida Citrus Commission* is now available. The organization of the material in the 1948 edition has been altered and new sections added to keep pace with current trends. Among the changes is an increased emphasis on the incidence of ascorbic acid deficiency. Information on this subject, which was included separately under different age groups in the first edition, is now consolidated in the opening section. A second change is the addition of a section on stress and the general adaptation syndrome. The handbook discusses the role citrus fruits play in the management of such disorders.

Milwaukee Lace Paper Company has designed a new and attractive paper place mat in the shape of an artist's palette. Larger than most mats, with approximate dimensions of 18 by 12 in., the new mat is available in three color combinations: coral pink and black; turquoise and black; and light olive green and black, all with white backgrounds. The mats were designed especially for use in modern decors of restaurants and homes.

Carnation Company is introducing a "hot cocoa" mix for fountain, restaurant, and institutional use. With the new mix, cocoa is prepared simply by adding hot water. The mix dissolves instantly. The new product is available in three sizes: a foil envelope containing one individual serving, 100 envelopes to a display case; a portion-control package reconstituting to 1 gal.; and a 25-lb. size for volume operations.

The new Downyflake Fruit Fillings offer top-grade fruit in generous measure with distinctive flavor, according to the *Downyflake Institutional Product Division, Doughnut Corporation of America*. Carefully selected fruits—apricots, raspberries, pineapple, and strawberries—are used to create this line of fruit fillings now being marketed with other new Downyflake products.

The Institutional Department of *Standard Brands Incorporated* has now published the recipes for the twenty top sandwiches in the recent National Sandwich Idea Contest. Titled "Building Your Sales with . . . Four Star Sandwiches," the booklet also includes a number of merchandising suggestions for restaurateurs.

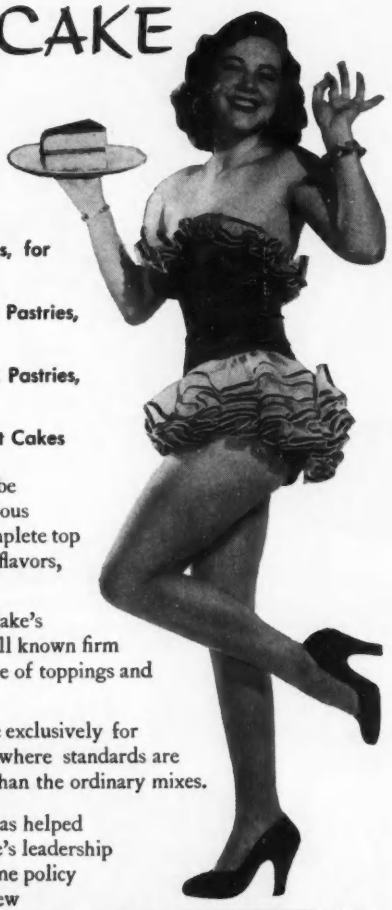
Institutional Feeding and Housing magazine has announced the appointment of Eulalia C. Blair as Food Management Editor. Until recently, Mrs. Blair was Manager, Institutional and Consumer Kitchens, General Foods Corporation, White Plains, New York. An A.D.A. member, Mrs. Blair has more than twenty years of varied experience in the food service field.

"The Greatest Guy" theme is featured on the October "Doily of the Month" of *Aatell and Jones*. The artwork and theme for the doily were borrowed from the Institutional Products Division, *General Foods*. Across the upper left hand section of the doily is the theme, "Greatest Guy

New! Downyflake

NOW ADDS THE FINISHING TOUCH OF

GLAMOR TO CAKE



FRUIT CONCENTRATES for Cake: Orange, Strawberry, Pineapple, Wild Cherry

FRUIT FILLINGS for Pastries, and Sweet Dough

DOWNYFLUFF for Meringue Toppings, for Desserts, Pies and Cake

ICINGS Fudge and Karmel for Cakes, Pastries, Donuts and Sweet Dough

CRUNCH TOPPING for Cakes, Donuts, Pastries, Sweet Dough

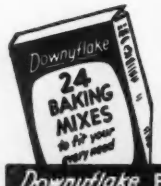
MINCE PIE FILLING for Pies and Fruit Cakes

Now your complete quality cake can be "Downyflake", down to the last delicious crumb. Downyflake now offers you complete top quality ingredient set-up, mix, fillings, flavors, and toppings.

The new products come from Downyflake's recent purchase of the 78 year old well known firm of Chapman & Smith, who make a line of toppings and fillings second to none.

Because Downyflake products are made exclusively for Restaurants, Hotels and Institutions, where standards are higher, we had to make them better than the ordinary mixes.

This quality policy has helped maintain Downyflake's leadership for 36 years. The same policy now applies to the new Downyflake toppings and fillings.



Downyflake BAKING MIX div. of Doughnut Corporation of America, 45 West 36th Street, New York 1, N. Y.

DOWNYFLAKE BAKING MIX JADA-10
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Gentlemen: ☐ I'm interested in your Downyflake Glamor Products.
☐ I would like a demonstrator to call.
Name_____
Firm or Institution_____
Address_____
City_____ Zone_____ State_____

Meat...

Good Nutrition and Endocrine Functioning

Maintenance of homeostasis attuned to health devolves upon good nutrition and normal functioning of the enzyme and endocrine systems.[1,2,3] Conversely, by impairing vital activities of the endocrines, poor nutrition can seriously disturb production of hormones needed to regulate metabolic processes.

Intense and prolonged deficiency in essential nutrients and food energy depresses pituitary, gonadal, and other endocrine activity, leading to subnormal physiologic states. Clinical studies exposing male volunteer subjects to a semistarvation diet produced symptoms resembling those of various endocrine dysfunctions.[4] Since the pituitary and other hormones are protein in nature, it appears logical to assume that protein nutrition plays an important part in their synthesis.[5]

Meat, by supplying valuable amounts of high quality protein, B vitamins, essential minerals, and fat containing unsaturated fatty acids, contributes importantly to any role that good nutrition may play in the maintenance of the endocrines, their functioning, and the production of hormones.

1. Ralli, E. P., and Dumm, M. E.: The Hormonal Control of Metabolism, in Wohl, M. G.: Modern Nutrition in Health and Disease, Philadelphia, Lea and Febiger, 1955, pp. 57-74.
2. McHenry, E. W.: Nutrition and Endocrine Function, Borden's Review of Nutrition Research, *16*:17 (Mar.-Apr.) 1955.
3. Ershoff, B. H.: Conditioning Factors in Nutritional Disease, Physiol. Rev. *28*:107 (Jan.) 1948.
4. Keys, A.; Brozek, J.; Henschel, A.; Mickelsen, O., and Taylor, H. L.: The Biology of Human Starvation, Minneapolis, University of Minnesota Press, 1950.
5. Samuels, L. T.: Progress in Clinical Endocrinology, New York, Grune and Stratton, 1950, p. 509.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago... Members Throughout the United States

in the World—The Man Who takes His Family Out to Dine." Bordering the place mat are outlines of various cooking utensils. Since *General Foods* instituted this promotion campaign, it has made a complete kit available to restaurateurs, including table tent cards, menu paste-on stickers, lapel emblems, mats for newspaper ads, post cards, mounted ad reprints, and other point-of-sale material.

"Fresh-O-Matic" by Wear-Ever, product of *The Aluminum Cooking Utensil Company, Inc.*, heats and freshens buns, rolls, muffins, pies, pre-cooked bacon, meats, and fowl, thus eliminating waste in prepared foods. It also steams clams, poaches eggs, cooks lobster, and barbecues ribs. The appliance occupies only a little more than 1 sq. ft. counter space (width 14½ in., depth 15 in., and height, 11 in.). It will hold either 12 dinner rolls, 10 muffins, 4 or 5 wedges of fruit pie, or 6 hamburger rolls. Tiny jets of dry steam penetrate foods in a few seconds. The water tank, accessible through a convenient opening, has a 6-qt. capacity.

"Snowflake," an instant-type whole milk powder, is now packed for the institutional trade. *Webster Van Winkle Corporation*, distributor for Sanna Dairies, announces that the product will be available in No. 10 tins, six to the case, each tin containing 4 lb. whole milk powder, which will make 16 qt. reconstituted whole fluid milk. "Snowflake" may be combined with hot water for prompt use in preparing cream soups, cream sauces, puddings, custards, or it may be chilled and used for milk shakes, soft custards, or drinking. Whole milk powder offers a saving in initial cost, storage, waste from spoilage, and is specially processed to resist curdling.

Victory Metal Manufacturing Corporation's refrigerator, the Vimco Stainless Steel Model DTS-16F-16-S, features a combination 16 cu. ft. normal temperature refrigerator and a 16 cu. ft. freezer. Interchangeable interiors are adjustable on 1-in. centers to take any combination of bakers' pan slides, stationary or pull-out meat rails, stationary or pull-out shelves, and refrigerated drawers. Other features include: all-metal construction, automatic defrosting, sanitary wipe-out bottom, automatic interior lighting, built-in cylinder locks, heavy die-cast handles on all doors; all interior corners coved, ground, welded, and polished; and corrosion-resistant aluminum on top, back, and bottom. The model is 50¼ in. in width, 30½ in. deep, exclusive of hardware; and 72¾ in. high.

A new counter-model electric food warmer, the N-2200, is offered by *Griswold Manufacturing Company*. Because it can be used either wet or dry, no water, steam, or drain connections are required in installation. Heat is conducted by enclosed strip-type heating elements securely clamped to the bottom of the cast aluminum well. Heat loss is minimized by a reflecting shield. Constant desired temperature in the heat well is maintained by an automatic thermostat. The unit will hold many combinations of standard-make pots and pans in its 12- by 20-in. well and has rounded corners for easy cleaning.

Bulletin T-142 of *Coleman Instruments, Inc.*, is titled "A Rapid Method for the Determination of Sodium and Potassium in Human Blood Serum or Plasma with the Coleman Model 21 Flame Photometer." An analytical procedure is outlined which requires only a single dilution of the serum or plasma sample and a single standardizing solution—a saving of considerable time without sacrificing accuracy. Also announced, in conjunction with the new procedure, is the Coleman No. 21-310 Micro Sample Container. With this instrument, complete sodium and potassium measurements can be carried out on as little as 0.02 ml. serum or plasma.

The "Foldkrest" table, manufactured by *Foldcraft Company*, is designed to solve the problem of providing extra seating in a hurry, while being equally suitable for permanent use. It is a pedestal-type, folding table of 16-gauge tubular steel, with a Masonite or plastic top in a variety of colors and patterns. The center post has been eliminated as well as the traditional legs at the corner—to the comfort of the diner. Table legs are rubber-tipped. The table is self-leveling and will not teeter because of a design which always compensates for uneven surfaces. A locking device insures complete rigidity. Connectors make it possible quickly to convert tables to banquet size. Foldkrest tables are available in sizes from 24 by 24 in., to 36 by 60 in., in standard 30-in. height, or with round tops 20 to 48 in. in diameter. Both

Let CREAM OF RICE help solve your modified diet problems

1
EXTRA NOURISHMENT

Cream of Rice is rich in iron plus Vitamins B_1, B_2, and Niacin.

It gives quick energy fast, too. Actually within a few minutes after eating. Cream of Rice is easy to digest. Many leading pediatricians advise it.

And many doctors recommend Cream of Rice in modified diets for food allergies, ulcers, high blood pressure, intestinal distress and old-age food difficulties.

2
EASY TO FIX

Now Cream of Rice cooks in just 30 seconds. That's 10 times faster! What could be easier . . . quicker . . . less work! It's a meal in half a minute. A delicious, nourishing, easy-to-digest cereal young and old enjoy.

3
CREAMY RICE TASTE

Cream of Rice has a delicate flavor. Different, delicious. This is a creamy rice treat that really tastes good.

Guaranteed by Good Housekeeping

COMMENDED BY PARENTS' MAGAZINE

FREE!
Professional Sample

Send your name and address to:
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West Chester, Pa.

EVERY GRAIN

Guaranteed fluffy!

. . . STAYS FLUFFY ALL THE WAY THROUGH AND IT'S WEEVIL PROOF

HIGHER VITAMIN CONTENT

plus a lower calorie count—in a Rice that's always fluffy—always uniform in quality and size. Comet Pre-fluffed meets the high standards of dieticians everywhere.

NO HARD CORES

or broken bits to spoil a delicate appetite. Guests love the delicious natural rice flavor of Comet Pre-fluffed Rice.

COSTS LESS

because Comet Pre-fluffed "re-heats" to its original perfection every time—eliminating waste. The fluffiest tastiest Rice you've ever served—at a LOWER COST PER POUND.

New COMET Pre-fluffed RICE

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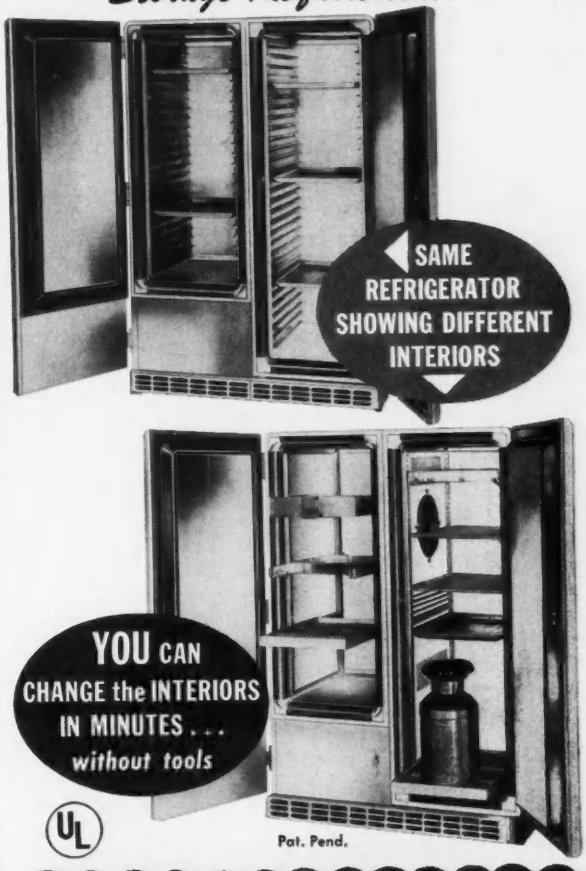
meet your day-to-day Food Storage Requirements



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Exclusive ball-bearing pull-out shelves allow closer spacing of shelves and permit easy access to items stored at rear.

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Every interior is adjustable to take any combination of stationary or pull-out shelves, refrigerated drawers, stationary or pull-out meat rails or bakers pan slides. Models from 15 to 90 cu. ft. in stainless steel, aluminum, baked white enamel or porcelain. Available as self-contained, remote or pass-thru.

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Simplify Service
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DIET CARDS

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Trays are easy to identify with these convenient 2¼" by 1¾" Diet Cards. Eleven standard diet subjects available, each on a different colored sturdy stock. Space allowed for patient's name, room and special notes. Write for samples and prices.

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SAVE
while you serve the BEST...

Brown Swiss
dry creamed
cocoa

serve hot or cold

- **No ingredients to add** — only water! Pure fresh cream, milk solids and sugar already in! You save preparation time . . . you save money!
- **Imported, finest-quality cocoa** for a rich-tasting yet light-bodied beverage!
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Packed in 3 pre-measured sizes:
1 case 300 1¼-ounce envelopes
each envelope makes 1 cup
1 case 24 15-ounce tins
each tin makes 2½ quarts
1 case 6 #10 tins
each tin makes 3 gallons
All sizes gas packed in air-tight containers to insure freshness
Webster Van Winkle Corporation

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Sanalac — non fat dry milk
Cheflac — dry sweet cultured buttermilk
Snowflake — whole milk powder
Van Winkle Milk Puddings and Pie Fillings
Van Winkle Concentrated Gelatins
Summit, New Jersey

regular and round tops are available also in a 28-in. height in the popular sizes.

Southern Equipment Company has issued a new sixteen-page, two-color catalog on "Sectional Cafeteria Counters." The new catalog is complete, showing the various component parts of a sectional cafeteria counter and how they can be assembled in many different combinations to fit individual needs and requirements. Also included are layout drawings to aid in planning custom-built cafeteria counters from standard sectional units.

Vischer Products' new "Flex-Seal System" speed cooker is adaptable to "off hours" or peak loads. Completely automatic individual cooking units handle small quantities of food in record time, due to a "short-time" cooking cycle which both heats and cools rapidly to shorten cooking time and prevent overcooking. A single unit prepares a whole meal for four in 5 to 10 min. Frozen foods are cooked without defrosting and a standard 2½-lb. package of frozen vegetables is ready to serve in 4 to 5 min. Of all stainless steel construction, the cooker is available in eight models with from one to five individual cooking units. Each unit is equipped with one solid and one perforated, 3-qt. stainless steel pan. A self-sealing door designed to eliminate steam hazard is featured.

The *National Dairy Council* has initiated a monthly menus and recipes service. The menus follow the Council's "Guide to Good Eating" meal planning pattern which conforms to accepted nutritional standards and which assumes average servings of the specific items included. The menus and recipes are printed on a 17 by 10½ in. sheet which is folded and punched for loose-leaf notebooks.

At the A. D. A. meeting in Milwaukee last month, *Pillsbury Mills, Inc.* introduced a new biscuit leavened with both yeast and baking powder. Appropriately named "Double-Raised Biscuits," samples were distributed along with recipes.

The Arrowhead Division, *International Molded Plastics Inc.*, is featuring its new line of decorated plastic institutional dinnerware. For the first time, a variety of colorful designs are available in plastic dinnerware. The line includes three patterns designed to enhance the appearance of food. Made of chip-proof Melmac plastic in a complete range of sizes, the patterns are molded right into the plastic and are said not to fade or peel, even in the hottest dishwater. The patterns are: "Militaire," a narrow-rim design with pale pink batons on a base color of red; "Ambassador," a narrow-rim leaf pattern in tangerine, sky blue, sunglow yellow, black, and mist green; and "Vine," a wide-rim design of attractive two-tone leaves in red-and-gray on white or green-and-yellow on white.

Pfaelzer Brothers, Inc., has released a booklet, "The Pfaelzer Story," commemorating its thirty years of service in meat purveying to the institutional field. Features of the booklet are many "firsts" of now-accepted practices in the field, such as the development of portion-ready meats.

CRAMORES CRYSTALS
are ideal for institutional use, providing consistent year-round top quality real fruit flavor—at half the price.

★ *Easy to use and store — no spoilage — no squeezing*
★ *Economical — you always have just the right amount on hand*

CRAMORES CRYSTALS
made from a base of pure, dehydrated citrus fruit juices with fruit components added to enhance flavor and body—are available in lemon-lime and orange.

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Point Pleasant, N.J.

EATING IS FUN—
for
Older People, Too

Designed to Aid Proprietors of Small Nursing Homes and Residences. Also Adaptable to Home Kitchens

This attractive booklet is a guide to better food and food service in the small institution.

Based on normal nutritional requirements for adults, the menu patterns, sample suppers, and pointers on meal planning have their place in any household. Practical ideas for making the work of the manager easier and pleasanter include a weekly marketing guide, hints for economy in buying and storage, and suggestions for serving.

This is a project of the Diet Therapy Section of The American Dietetic Association.

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